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OFFICIAL GAZETTE

of the

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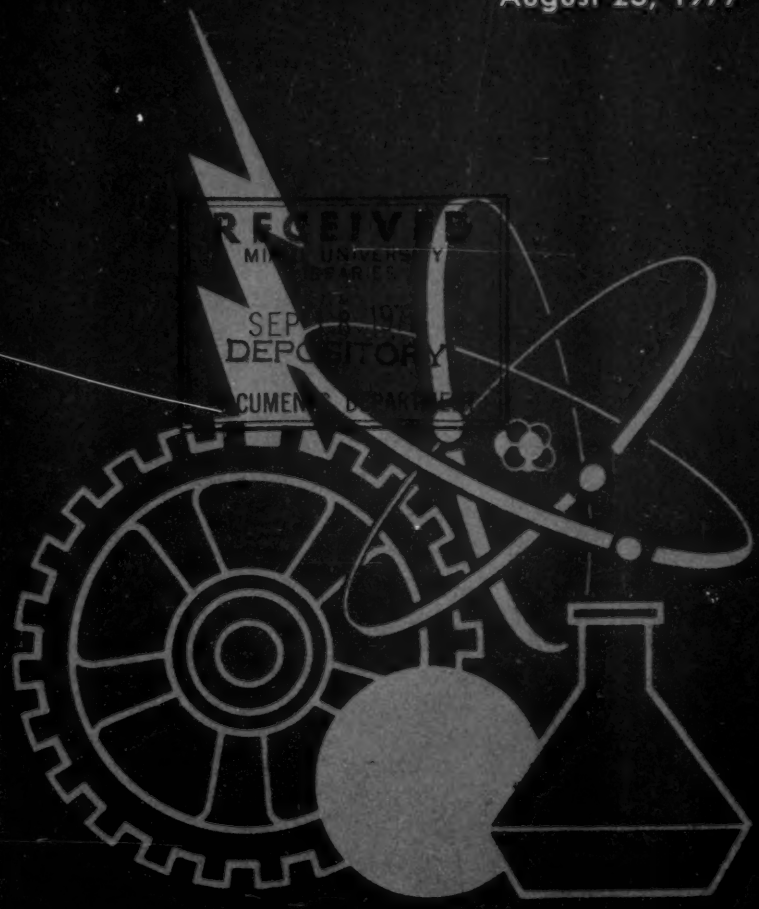
PATENTS

August 23, 1977



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

August 23, 1977 Volume 961 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Extensions of Time To Submit Affidavits After Final Rejection

Not infrequently, applicants request an extension of time, stating as a reason therefor that more time is needed in which to submit an affidavit. When such a request is filed after final rejection, the granting of the request for extension of time is without prejudice to the right of the examiner to question why the affidavit is now necessary and why it was not earlier presented. If applicant's showing is insufficient, the examiner may deny entry of the affidavit, notwithstanding the previous grant of an extension of time to submit it. The grant of an extension of time in these circumstances serves merely to keep the case from becoming abandoned while allowing the applicant the opportunty to present the affidavit or to take other appropriate action. Moreover, prosecution of the application to save it from abandonment must include such timely, complete and proper action as required by 37 CFR 1.113. The admission of the affidavit for purposes other than allowance of the application, or the refusal to admit the affidavit, and any proceedings relative thereto, shall not operate to save the application from abandonment.

Implicit in the above practice is the fact that affidavits submitted after final rejection are subject to the same treatment as amendments submitted after final rejection. *In re Affidavit Filed After Final Rejection*, 152 USPQ 292, 1966 C.D. 53.

WILLIAM FELDMAN,

July 25, 1977. *Deputy Assistant Commissioner for Patents.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,906,875, E. T. Molinaro, STATION SAMPLING RADIO, **filed** Dec. 20, 1973, D.C. Del. (Wilmington) Doc. 4780, *Anthony P. Catanzaro* v. *International Telephone & Telegraph et al.* Final judgment, it is ordered, with respect to the complaint, defendants' motion for summary judgment is granted and judgment is entered in favor of defendants. Counterclaims do not infringe said patent, Apr. 1, 1977.

2,959,374, I. R. Laskowitz, JET-POWERED ROTORLESS CONVERTIBLE AIRCRAFT, **filed** Mar. 17, 1977, *United* States Court of Claims (District of Columbia) Doc. 149–77, *Isidor B. Laskowitz* v. *The United States.*

3,032,345, J. H. Lemelson, TARGET GAME; **3,917,271,** Lemelson and Elfman, BALL FOR TARGET GAMES, **filed** Nov. 17, 1976, D.C., S.D.N.Y., Doc. 76–C–5146 TPG, *Jerome H. Lemelson and Synergistics Research Corporation* v. *Centsable Toys, Inc. and M. W. Kasch Company, Inc.*

3,032,345, J. H. Lemelson, TARGET GAME, **filed** Dec. 17, 1975, D.C.N.J. (Trenton) Doc. 75–2168, *Gammon, Inc., doing business as Gammon Games* v. *Jerome H. Lemelson and Synergistics Research Corporation.* Default judgment on counterclaim in favor of defendants and against plaintiff. Defendants' causes for action on damages and amended and supplemental complaint dismissed without prejudice, Mar. 1, 1977.

3,032,345, J. H. Lemelson, TARGET GAME; **3,857,566,** Lemelson and Elfman, ADHESIVE SURFACE DART AND SHOCK ABSORBING TARGET; **3,917,271,** same, BALL FOR TARGET GAMES, **filed** Mar. 21, 1977, D.C.N.J. (Trenton) Doc. 77–0553, *Synergistics Research Corp.* v. *S. S. Kresge Co.*

3,037,178, H. Pien, LOAD CELL, **filed** Mar. 16, 1973, D.C. Ariz. (Phoenix) Doc. C–73–171–Phx WEC, *BLH Electronics, Inc.* v. *Interface, Inc.* Stipulation for dismissal and order, Mar. 23, 1977.

3,047,196, Levine and Phillips, GARMENT HANGER, **filed** Nov. 11, 1976, D.C., S.D.N.Y., Doc. 76–C–5241DBB, *A & E Warbern Inc.* v. *Carter Industries, Inc.* Judgment, defendants is hereby restrained and enjoined from directly or indirectly infringing said patent, Mar. 30, 1977.

3,049,399, Gamson and Kuehner, COMPOSITION AND METHOD FOR DEODORIZING AIR, **filed** Apr. 11, 1977, D.C., S.D. Tex (Houston) Doc. CA H–77–571, *H. E. Burroughs & Associates, Inc.* v. *Stay-Fresh Corporation.* **Same, filed** Apr. 11, 1977, D.C., N.D. Tex. (Dallas) Doc. CA3–77–0472, *H. E. Burroughs & Associates, Inc.* v. *Gunter & Associates.*

3,090,605, Copeland and Neier, FEED MIXER **filed** Mar. 28, 1977, D.C. Colo. (Denver) Doc. 77–M–308 *B/J Manufacturing Co., Inc.* v. *Mohrlang Manufacturing, Inc.*

3,139,731, O. E. Liddell, BAND-TYPE BARRIER ENCASEMENT FOR PROTECTING TIMBERS AGAINST MARINE BORER ATTACK, **filed** Feb. 14, 1975, D.C., N.D. Calif. (San Francisco) Doc. C–75–330 SAW, *Osmose Wood Preserving Co. of America, Inc. and Harry W. Stiritz, Jr., trustee* v. *City of Redwood City and The Zipper Tubing Co.* Claims 4 and 9 of said patent are good and valid in law; defendants have not infringed said claims, Apr. 15, 1977.

3,223,252, C. A. Mikus, TREATMENT OF GLASS; **3,223,501,** Fredley and Sleighter, METHOD AND APPARATUS FOR TREATING GLASS ON A PRESSURIZED FLUID BED; **3,281,229,** H. A. McMaster, THERMALLY COMPENSATED BED FOR SUPPORTING GLASS SHEETS; **3,282,447,** same, CONVEYING APPARATUS; **3,291,590,** same, APPARATUS FOR BENDING GLASS SHEETS; **3,293,015,** Fredley and Sleighter, METHOD AND APPARATUS FOR TEMPERING GLASS SHEETS ON A GAS SUPPORTED BED; **3,332,759,** McMaster and Nitschke, METHOD OF AND APPARATUS FOR MANUFACTURING GLASS SHEETS ON A GAS SUPPORT BED; **3,332,760,** McMaster and Van Zee, APPARATUS PROVIDING A GASEOUS SUPPORT BED AND METHOD FOR TREATING GLASS OR THE LIKE THEREON; **3,332,762,** McMaster and Nitschke, METHOD OF AND APPARATUS FOR HEAT TREATING GLASS SHEETS ON A GAS SUPPORT BED; **3,338,697,** McMaster and Nitschke, GASEOUS SUPPORT BED FOR CONVEYING AND HEAT TREATING GLASS SHEETS; **3,399,042,** same, METHOD AND APPARATUS FOR CONVEYING AND HEAT TREATING GLASS SHEETS OVER A GAS SUPPORT BED; **3,402,036,** D. H. McMaster, METHOD AND APPARATUS FOR CONVEYING AND CURVING GLASS SHEET MATERIAL ON A GAS SUPPORT BED; **3,497,340,** Dennison and Rigby, METHOD OF TEMPERING AND RESHAPING GLASS SHEETS; **3,526,490,** G. W. Misson, METHOD OF BENDING GLASS ON FLUID SUPPORT, **filed** Mar. 7, 1972, D.C., N.D. Ohio (Toledo) Doc. 72–71, *PPG Industries, Inc.* v. *Guardian Industries Corporation.* Action dismissed on the merits, Jan. 26, 1977.

3,223,501. (See 3,332,252.)

3,263,678, J. H. Everston, THERAPEUTIC BATHTUB HAVING PLURAL ASPIRATING FITTINGS, **filed** June 15, 1976, D.C., N.D. Ill. (Chicago) Doc. 76c2219, *The Celotex Corporation* v. *The Jacuzzi Research, Inc.* Defendant's motion for summary judgment is hereby granted and the instant action is ordered dismissed, Mar. 18, 1977.

3,281,229. (See 3,223,252.)

3,282,447. (See 3,223,252.)

3,291,590. (See 3,223,252.)

3,293,015. (See 3,223,252.)

3,332,759. (See 3,223,252.)

3,332,760. (See 3,223,252.)

3,332,762. (See 3,223,252.)

3,338,697. (See 3,223,252.)

3,399,042. (See 3,223,252.)

3,402,036. (See 3,223,252.)

3,403,868, W. P. Lear, MAGNETIC TAPE CARTRIDGE SYSTEM, **filed** Mar. 25, 1977, D.C. Mass. (Boston) Doc. 76–865–T, *Entec Plastics Engineering Corp.* v. *Gates Rubber Company.*

3,447,479, D. Rosenberg, SYRINGE PUMP, **filed** Mar. 22, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1064–R, *Imed Corporation* v. *Pall Corporation.*

3,497,340. (See 3,223,252.)

3,526,490. (See 3,223,252.)

3,665,477, Budrow and Reed, ELEVATABLE AND FOLDABLE ANTENNA, **filed** Aug. 15, 1974, D.C., N.D. Ind. (South Bend), Doc. S74–174, *Barker Manufacturing Company, Inc.* v. *Cobra Industries, Inc.* The issues have been withdrawn from the court by stipulation of the parties, the plaintiff's complaint and the counterclaim of the defendant are dismissed without prejudice, Mar. 28, 1977.

3,713,926, L. L. Speer, METHOD FOR PATCHING MATERIALS, **filed** Oct. 8, 1976, D.C., N.D. Ohio (Toledo) Doc. 76–129, *Vyna-Chem (Canada), Ltd.* v. *Lawrence L. Speer et al.* Defendants are hereby permanently restrained and enjoined from making, using and selling said patching kits, Apr. 12, 1977.

3,758,098, M. Vrilakas, MACHINE FOR WORKING ON DRIVE SHAFTS, **filed** Mar. 30, 1976, D.C., N.D. Calif. (San Francisco) Doc. C–76–636–SAW, *Drive Line Service Inc.* v. *Robert F. Gaffney, doing business as Drive Shaft Repair and Edward W. Hobgood, Jr.* Consent judgment, patent is valid; defendant, Drive Shaft licensed by plaintiff; Hobgood dismissed, Mar. 30, 1977.

3,776,095, M. G. Atchisson, WEAPON CONVERSION BOLT ASSEMBLY DEVICE, **filed** Sept. 15, 1976, D.C., N.D. Ga. (Atlanta) Doc. C76–1518A, *Bingham, Ltd.* v. *J. P. Foote & Company.* **Same, filed** Feb. 25, 1977, D.C., N.D. Ga. (Atlanta) Doc. C77–342A, *Bingham Ltd. and Maxwell G. Atchisson* v. *J. P. Foote & Company, J. P. Foote and U.S. Armament Corporation.*

3,857,566, Lemelson and Elfman, ADHESIVE SURFACE DART AND SHOCK ABSORBING TARGET; **3,917,271,** same, BALL FOR TARGET GAMES, **filed** Nov. 24, 1976, D.C., N.D. Ill. (Chicago) Doc. 76c4371, *Centsable Prod. et al. and Centsable Toys* v. *Jerome H. Lemelson and Synergistics Research Corp.*

3,911,892, G. H. Harris, STOVE CONSTRUCTION, **filed** Mar. 21, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1050–RMT, *Lakewood Manufacturing Co.* v. *Hearth Craft, Inc. et al.*

3,917,271. (See 3,032,345.)

3,917,271. (See 3,857,566.)

3,999,756, H. Head, TENNIS RACKET, **filed** Feb. 14, 1977, D.C.N.J. (Trenton) Doc. 77–0285, *Prince Manufacturing, Inc.* v. *J. C. Penney Company, Inc.* Permanent injunction for the plaintiff, Apr. 5, 1977.

4,000,620, M. M. Burge, GRAVITATIONAL IRRIGATION SYSTEM AND METHOD OF INSTALLING, **filed** Feb. 23, 1977, D.C. N. Dak. (Bismarck) Doc. A77–1015, *Blumhardt Manufacturing, Inc.* v. *Nu-Flex Irrigation, Inc. and Merle M. Burge.*

4,004,552, G. Levin, EGG INCUBATING TRAY WITH RACK AND SLIDE, **filed** Apr. 6, 1977, D.C., S.D. Ga. (Savannah) Doc. CV477–83, *Gerd Levin* v. *Glennville Hatchery, Inc.* **Same, filed** Apr. 7, 1977, D.C., E.D. Ky. (Lexington) Doc. 77–41, *Gerd Levin* v. *Hinton Hatchery, Inc.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,193,402, Re. S.N. 801,089, Filed May 27, 1977, Cl. 106/58, REFRACTORY COMPOSITION FOR REPAIRING FURNACES, Samuel Rusoff, et al., Owner of Record: *Basic Incorporated, Cleveland, Ohio,* Attorney or Agent: Armand P. Boisselle, et al., Ex. Gp.: 115

3,710,000, Re. S.N. 805,259, Filed June 10, 1977, Cl. 174/15 C, HYBRID SUPERCONDUCTING MATERIAL, Walter J. Shattes, et al., Owner of Record: *Air Reduction Company, Incorporated, New York, N.Y.,* Attorney or Agent: Michael M. De Angeli, et al., Ex. Gp.: 213

3,728,480, Re. S.N. 810,538, Filed June 27, 1977, Cl. 178/6.8, TELEVISION GAMING AND TRAINING APPARATUS, Ralph H. Baer, Owner of Record: *Sanders Associates, Inc., Nashua, N.H.,* Attorney or Agent: Louis Etlinger, Ex. Gp.: 233

3,769,040, Re. S.N. 807,054, Filed June 16, 1977, Cl. 426/65, SUBSTITUTED THIAZOLES AND FLAVORING PROCESSES AND PRODUCTS PRODUCED THEREBY, Alan O. Pittet, et al., Owner of Record: *International Flavors & Fragrances, Inc., New York, N.Y.,* Attorney or Agent: Arthur L. Liberman, Ex. Gp.: 172

3,829,095, Re. S.N. 810,542, Filed June 27, 1977, Cl. 273/101.1, METHOD OF EMPLOYING A TELEVISION RECEIVER FOR ACTIVE PARTICIPATION, Ralph H. Baer, Owner of Record: *Sanders Associates, Inc., Nashua, N.H.,* Attorney or Agent: Louis Etlinger, Ex. Gp.: 334

3,853,128, Re. S.N. 808,982, Filed June 22, 1977, Cl. 128/275, VALVED UNDERWATER DRAINAGE APPARATUS, Leonard D. Kurtz, et al., Owner of Record: *Deknatel, Inc., Queens Village, N.Y.,* Attorney or Agent: Roberts B. Larson, et al., Ex. Gp.: 335

3,892,481, Re. S.N. 811,460, Filed June 29, 1977, Cl. 355/10, AUTOMATIC DEVELOPMENT ELECTRODE BIAS CONTROL SYSTEM, Louis F. Schaefer, et al., Owner of Record: *Savin Business Machines Corporation, Valhalla, N.Y.,* Attorney or Agent: Henry L. Shenier, et al., Ex. Gp.: 212

3,904,098, Re. S.N. 810,263, Filed June 27, 1977, Cl. 226/97, LOOP ERECTING DEVICE, Sam Kupperman, et al., Owner of Record: *R B Toy Development Company, Skokie, Ill.,* Attorney or Agent: Edward U. Dithmar, et al., Ex. Gp.: 313

3,929,215, Re. S.N. 810,440, Filed June 27, 1977, Cl. 197/1 R, PRINTING MECHANISM, Toshio Hayakawa, Owner of Record: *Matsushita Electric Industrial Company Limited, Kadoma City, Osaka, Japan,* Attorney or Agent: Robert E. Burns, et al., Ex. Gp.: 337

3,967,158, Re. S.N. 811,341, Filed June 29, 1977, Cl. 315/169 TV, CIRCUIT FOR OPERATING A BAR GRAPH DISPLAY PANEL, Richard A. Saxon, Owner of Record: *Inventor,* Attorney or Agent: Robert A. Green, Ex. Gp.: 256

3,986,569, Re. S.N. 809,708, Filed June 24, 1977, Cl. 175/52, DRILL STRING ELEMENT HANDLING APPARATUS, Jonas Olof Anders Hilding, et al., Owner of Record: *Atlas Copco Aktiebolag, Nacka, Sweden,* Attorney or Agent: Robert D. Flynn, et al., Ex. Gp.: 354

3,994,454, Re. S.N. 809,405, Filed June 23, 1977, Cl. 244/153 R, CONTROLLABLE STUNT KITE HAVING A PAIR OF SYMMETRICAL BRIDLES, Lynn M. Worsham, Owner of Record: *Inventor,* Attorney or Agent: Robert W. Keller, Ex. Gp.: 315

4,019,244, Re. S.N. 807,314, Filed June 16, 1977, Cl. 29/520, SPIRAL WOUND GASKET ASSEMBLY METHOD, A. B. Owen, et al., Owner of Record: *Lamons Metal Gasket Company, Houston, Tex.,* Attorney or Agent: B. R. Pravel, et al., Ex. Gp.: 321

PATENT NOTICES

Certificates of Correction for the Week of Aug. 23, 1977

Re. 28,850	4,013,021	4,020,839	4,026,249
Re. 29,075	4,013,032	4,021,253	4,026,303
3,679,705	4,013,214	4,021,375	4,026,558
3,776,941	4,013,755	4,021,500	4,026,632
3,779,917	4,013,804	4,021,623	4,026,667
3,901,861	4,014,491	4,021,774	4,026,671
3,910,231	4,014,556	4,021,933	4,026,709
3,929,811	4,014,664	4,021,990	4,026,712
3,938,260	4,014,839	4,022,018	4,026,841
3,940,415	4,015,445	4,022,140	4,027,097
3,948,674	4,015,538	4,022,192	4,027,141
3,951,268	4,016,003	4,022,382	4,027,162
3,952,164	4,016,225	4,022,788	4,027,192
3,958,225	4,016,686	4,022,805	4,027,206
3,958,431	4,016,706	4,022,901	4,027,280
3,961,658	4,016,711	4,023,036	4,027,289
3,965,082	4,016 860	4,023,098	4,027,293
3,967,721	4,017,019	4,023,418	4,027,312
3,968,136	4,017,289	4,023,482	4,027,436
3,972,828	4,017,314	4,023,583	4,027,442
3,974,233	4,017,320	4,023,696	4,027,476
3,975,196	4,017,335	4,023,725	4,027,538
3,983,158	4,017,338	4,023,872	4,027,551
3,983,312	4,017,475	4,023,912	4,027,660
3,986,935	4,017,625	4,024,061	4,027,670
3,988,634	4,017,747	4,024 128	4,027,826
3,989,676	4,017,789	4,024,145	4,027,898
3,989,801	4,018,053	4,024,189	4,027,954
3,990,970	4,018,130	4,024,281	4,028,108
3,992,916	4,018,177	4,024,468	4,028,117
3,993,472	4,018,605	4,024,522	4,028,209
3,997,618	4,018,903	4,024,699	4,028,444
3,998,669	4,018,928	4,024,742	4,028,467
3,999,075	4,018,988	4,024 789	4,028,529
4,002,635	4,019,375	4,024,910	4,028 575
4,004,023	4,019,760	4,024,975	4,028,787
4,005,223	4,019,789	4,025,028	4,028,862
4,006,145	4,019,821	4,025,092	4,028,903
4,006,722	4,019,884	4,025,424	4,029,305
4,006,984	4,020,107	4,025,468	4,029,422
4,007,764	4,020 124	4,025,795	4,029,565
4,008,191	4,020,317	4,025 814	4,029,600
4,008,337	4,020,452	4,025,854	4,029 610
4,008,338	4,020,529	4,025,907	4,029,696
4,009,181	4,020,762	4,026,011	4,029,742
4,010,469	4,020,773	4,026,193	
4,012,238	4,020,820	4,026,223	

Dedications

3,398,879.—*Brian David James,* Menlo Park, and *Theodore K. Tom,* Sunnyvale, Calif. ASYMMETRIC ION PUMP AND METHOD. Patent dated Aug. 27, 1968. Dedication filed June 17, 1977, by the assignee, *The Perkin-Elmer Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,412,858.—*Spencer A. Stone,* Fort Wayne, Ind. HYDRAULIC CLASSIFIER HAVING AUTOMATIC UNDERFLOW DISCHARGE CONTROL. Patent dated Nov. 26, 1968. Dedication filed June 16, 1977, by the assignee, *The Desiter Concentrator Company, Inc.*

Hereby dedicates to the Public the remaining term of said patent.

3,438,586.—*Vincent W. Cancilla,* Pittsfield, Mass. TWO-PIPE DISC REFINER. Patent dated Apr. 15, 1969. Dedication filed May 6, 1977, by the assignee, *Beloit Corporation.*

Hereby dedicates to the Public the entire term of said patent.

3,561,887.—*Leo C. Reeve,* Lombard, Ill. PUMP CONSTRUCTION FOR PUMPING ABRASIVE MATERIALS. Patent dated Feb. 9, 1971. Dedication filed June 16, 1977, by the assignee, *Portland Cement Association.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,667,878.—*Leo C. Reeve,* Lombard, Ill. PUMP CONSTRUCTION. Patent dated June 6, 1972. Dedication filed June 16, 1977, by the assignee, *Portland Cement Association.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,829,730.—*Clair W. Reash,* Fairview Park, and *Vincent Pietrasz,* Cleveland, Ohio. GETTER ASSEMBLY. Patent dated Aug. 13, 1974. Dedication filed June 29, 1977, by the assignee, *Union Carbide Corporation.*

Hereby dedicates to the Public the remaining term of said patent.

3,857,931.—*Hans Jacob Hager,* New York, N.Y. LATEX POLYMER REAGENTS FOR DIAGNOSTIC TESTS. Patent dated Dec. 31, 1974. Dedication filed July 20, 1977, by the assignee, *Hoffmann-La Roche Inc.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,959,022.—*Lutgard C. De Jonghe* and *Harish Chandan,* Ithaca,, N.Y. METHOD FOR PRODUCING SODIUM-BETA-ALUMINA SOLID ELECTROLYTES. Patent dated May 25, 1976. Dedication filed June 27, 1977, by the assignee, *Cornell Research Foundation, Inc.*

Hereby dedicates to the Public the entire term of said patent.

Disclaimers

Reissue No. 29,234.—*Richard H. Heeren,* Palatine, Ill. FET LOGIC GATE CIRCUITS. Patent dated May 24, 1977. Disclaimer filed July 7, 1977, by the assignee, *Teletype Corporation.*

Hereby enters this disclaimer to claim 3 of said patent.

Reissue No. 29,248.—*Wayne Congleton,* Walnut, Calif. CONTAINER. Patent dated June 7, 1977. Disclaimer filed July 9, 1977, by the assignee, *Dolco Packaging Corporation.*

The term of this patent subsequent to Sept. 10, 1991 has been disclaimed.

3,498,746.—*Roy G. Smaltz,* Valrico, *William A. Satterwhite,* Lakeland, and *Paul R. Roberts,* Plant City, Fla. RECOVERY OF FLUOSILICIC ACID AND P_2O_5 FROM RECYCLE STREAMS AND POND WATER. Patent dated Mar. 3, 1970. Disclaimer filed June 24, 1977, by the assignee, *United States Steel Corporation.*

Hereby enters this disclaimer to all of the claims therein of said patent.

3,531,368.—*Miyoshi Okamoto*, Ohtsu-shi, *Koji Watanabe*, Sonoyama, *Yasuhiko Nukushina*, Kyoto, and *Tsuneo Azawa*, Ohtsu-shi, Japan. SYNTHETIC FILAMENTS AND THE LIKE. Patent dated Sept. 29, 1970. Disclaimer filed June 20, 1977, by the assignee, *Toray Industries, Inc.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,588,844.—*Alton O. Christensen*, Houston, Tex. SENSE AMPLIFIER FOR SINGLE DEVICE PER BIT MOSFET MEMORIES. Patent dated June 28, 1971. Disclaimer filed June 20, 1977, by the assignee, *Shell Oil Company*.

Hereby enters this disclaimer to claims 1–14 of said patent.

3,847,638.—*George O. Suman, Jr.* and *Edwin A. Richardson*, Houston, and *Ronald F. Scheuerman*, Bellaire, Tex. HYDRATED METAL OXIDE DEPOSITION. Patent dated Nov. 12, 1974. Disclaimer filed July 6, 1976, by the assignee, *Shell Oil Company*.

Hereby enters this disclaimer to all of the claims of said patent.

3,864,091.—*Ivo Mavrovic*, New York, N.Y. APPARATUS FOR THE DECOMPOSITION OF AMMONIUM CARBAMATE. Patent dated Feb. 4, 1975. Disclaimer filed June 15, 1977, by the inventor.

Hereby enters this disclaimer to claims 1 through 3 of said patent.

3,908,657.—*Avinoam Kowarski*, Baltimore, Md. SYSTEM FOR CONTINUOUS WITHDRAWAL OF BLOOD. Patent dated Sept. 30, 1975. Disclaimer filed July 5, 1977, by the assignee, *The Johns Hopkins University*.

Hereby enters this disclaimer to all claims of said patent.

4,006,743.—*Avinoam Kowarski*, Baltimore, Md. SYSTEM FOR CONTINUOUS WITHDRAWAL OF BLOOD. Patent dated Feb. 8, 1977. Disclaimer filed July 6, 1977, by the assignee, *The Johns Hopkins University*.

Hereby enters this disclaimer to all claims of said patent.

BUDAPEST MICROORGANISM TREATY

The Diplomatic Conference for the Conclusion of a Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure was held in Budapest, Hungary from April 14 to 28, 1977. Some 31 States, one intergovernmental organization and 11 international non-governmental organizations were represented in the Diplomatic Conference. Following two weeks of negotiations, the Treaty was adopted by the Diplomatic Conference on April 27, 1976 and signed the following day by 13 States, including the United States. The Treaty will enter into force three months after ratification or accession by five States.

The ratification of the Treaty by the United States would give certain advantages to an inventor of a microbiological invention seeking patent protection in a number of countries. An inventor would be able to rely on a single deposit of the microorganism in an approved depositary to satisfy the disclosure requirements of all the member countries of the Union established by the Treaty. Each country will be able to nominate depositaries in its territory for approval, if the depositaries meet the scientific standards required by the Treaty. The public release of a deposit will be governed by the patent laws of the country or countries under which the deposit was made.

We are seeking the views of the public on the advisability of ratification by the United States. Views on the ratification of the Treaty should be submitted to this Office prior to October 14, 1977. If you have any questions or wish further information, please write or call Mr. Michael K. Kirk, Director, Office of Legislation and International Affairs, c/o The Commissioner of Patents and Trademarks, Washington, D.C. 20231 (telephone (703) 557–3065).

August 1, 1977

C. MARSHALL DANN
Commissioner of Patents and Trademarks

(The Treaty and Regulations below are reproduced from the May, 1977 issue of *Industrial Property*, published by the World Intellectual Property Organization, Geneva, Switzerland.)

Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure*

Done at Budapest on April 28, 1977

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**Official English title.*
Source: International Bureau of WIPO.
Note: This Treaty was signed on April 28, 1977, at Budapest, by the following States: Bulgaria, Denmark, Finland, France, Germany (Federal Republic of), Hungary, Italy, Netherlands, Norway, Spain, Switzerland, United Kingdom, United States of America; it will remain open for signature at Budapest until December 31, 1977.
** This Table of Contents is added for the convenience of the reader *(Editor's Note)*.

INTRODUCTORY PROVISIONS

Article 1

Establishment of a Union

The States party to this Treaty (hereinafter called "the Contracting States") constitute a Union for the international recognition of the deposit of microorganisms for the purposes of patent procedure.

Article 2

Definitions

For the purposes of this Treaty and the Regulations:

(i) references to a "patent" shall be construed as references to patents for inventions, inventors' certificates, utility certificates, utility models, patents or certificates of addition, inventors' certificates of addition, and utility certificates of addition;

(ii) "deposit of a microorganism" means, according to the context in which these words appear, the following acts effected in accordance with this Treaty and the Regulations; the transmittal of a microorganism to an international depositary authority, which receives and accepts it, or the storage of such a microorganism by the international depositary authority, or both the said transmittal and the said storage;

(iii) "patent procedure" means any administrative or judicial procedure relating to a patent application or a patent;

(iv) "publication for the purposes of patent procedure" means the official publication, or the official laying open for public inspection, of a patent application or a patent;

(v) "intergovernmental industrial property organization" means an organization that has filed a declaration under Article 9(1);

(vi) "industrial property office" means an authority of a Contracting State or an intergovernmental industrial property organization competent for the grant of patents;

(vii) "depositary institution" means an institution which provides for the receipt, acceptance and storage of microorganisms and the furnishing of samples thereof;

(viii) "international depositary authority" means a depositary institution which has acquired the status of international depositary authority as provided in Article 7;

(ix) "depositor" means the natural person or legal entity transmitting a microorganism to an international depositary authority, which receives and accepts it, and any successor in title of the said natural person or legal entity;

(x) "Union" means the Union referred to in Article 1;

(xi) "Assembly" means the Assembly referred to in Article 10;

(xii) "Organization" means the World Intellectual Property Organization;

(xiii) "International Bureau" means the International Bureau of the Organization and, as long as it subsists, the United International Bureaux for the Protection of Intellectual Property (BIRPI);

(xiv) "Director General" means the Director General of the Organization;

(xv) "Regulations" means the Regulations referred to in Article 12.

CHAPTER I

SUBSTANTIVE PROVISIONS

Article 3

Recognition and Effect of the Deposit of Microorganisms

(1) *(a)* Contracting States which allow or require the deposit of microorganisms for the purposes of patent procedure shall recognize, for such purposes, the deposit of a microorganism with any international depositary authority. Such recognition shall include the recognition of the fact and date of the deposit as indicated by the international depositary authority as well as the recognition of the fact that what is furnished as a sample is a sample of the deposited microorganism.

(b) Any Contracting State may require a copy of the receipt of the deposit referred to in subparagraph *(a)*, issued by the international depositary authority.

(2) As far as matters regulated in this Treaty and the Regulations are concerned, no Contracting State may require compliance with requirements different from or additional to those which are provided in this Treaty and the Regulations.

Article 4

New Deposit

(1) *(a)* Where the international depositary authority cannot furnish samples of the deposited microorganism for any reason, in particular,

(i) where such microorganism is no longer viable, or

(ii) where the furnishing of samples would require that they be sent abroad and the sending or the receipt of the samples abroad is prevented by export or import restrictions,

that authority shall, promptly after having noted its

inability to furnish samples, notify the depositor of such inability, indicating the cause thereof, and the depositor, subject to paragraph (2) and as provided in this paragraph, shall have the right to make a new deposit of the microorganism which was originally deposited.

(b) The new deposit shall be made with the international depositary authority with which the original deposit was made, provided that:

(i) it shall be made with another international depositary authority where the institution with which the original deposit was made has ceased to have the status of international depositary authority, either entirely or in respect of the kind of microorganism to which the deposited microorganism belongs, or where the international depositary authority with which the original deposit was made discontinues, temporarily or definitively, the performance of its functions in respect of deposited microorganisms;

(ii) it may be made with another international depositary authority in the case referred to in subparagraph *(a)* (ii).

(c) Any new deposit shall be accompanied by a statement signed by the depositor alleging that the newly deposited microorganism is the same as that originally deposited. If the allegation of the depositor is contested, the burden of proof shall be governed by the applicable law.

(d) Subject to subparagraphs *(a)* to *(c)* and *(e)*, the new deposit shall be treated as if it had been made on the date on which the original deposit was made where all the preceding statements concerning the viability of the originally deposited microorganism indicated that the microorganism was viable and where the new deposit was made within three months after the date on which the depositor received the notification referred to in subparagraph *(a)*.

(e) Where subparagraph *(b)* (i) applies and the depositor does not receive the notification referred to in subparagraph *(a)* within six months after the date on which the termination, limitation or discontinuance referred to in subparagraph *(b)* (i) was published by the International Bureau, the three-month time limit referred to in subparagraph *(d)* shall be counted from the date of the said publication.

(2) The right referred to in paragraph (1)*(a)* shall not exist where the deposited microorganism has been transferred to another international depositary authority as long as that authority is in a position to furnish samples of such microorganism.

Article 5

Export and Import Restrictions

Each Contracting State recognizes that it is highly desirable that, if and to the extent to which the export from or import into its territory of certain kinds of microorganisms is restricted, such restriction should apply to microorganisms deposited, or destined for deposit, under this Treaty only where the restriction is necessary in view of national security or the dangers for health or the environment.

Article 6

Status of International Depositary Authority

(1) In order to qualify for the status of international depositary authority, any depositary institution must be located on the territory of a Contracting State and must benefit from assurances furnished by that State to the effect that the said institution complies and will continue to comply with the requirements specified in paragraph (2). The said assurances may be furnished also by an intergovernmental industrial property organization; in that case, the depositary institution must be located on the territory of a State member of the said organization.

(2) The depositary institution must, in its capacity of international depositary authority:

(i) have a continuous existence;

(ii) have the necessary staff and facilities, as prescribed in the Regulations, to perform its scientific and administrative tasks under this Treaty;

(iii) be impartial and objective;

(iv) be available, for the purposes of deposit, to any depositor under the same conditions;

(v) accept for deposit any or certain kinds of microorganisms, examine their viability and store them, as prescribed in the Regulations;

(vi) issue a receipt to the depositor, and any required viability statement, as prescribed in the Regulations;

(vii) comply, in respect of the deposited microorganisms, with the requirement of secrecy, as prescribed in the Regulations;

(viii) furnish samples of any deposited microorganism under the conditions and in conformity with the procedure prescribed in the Regulations.

(3) The Regulations shall provide the measures to be taken:

(i) where an international depositary authority discontinues, temporarily or definitively, the performance of its functions in respect of deposited microorganisms or refuses to accept any of the kinds of microorganisms which it should accept under the assurances furnished;

(ii) in case of the termination or limitation of the status of international depositary authority of an international depositary authority.

Article 7

Acquisition of the Status of International Depositary Authority

(1)*(a)* A depositary institution shall acquire the status of international depositary authority by virtue of a written communication addressed to the Director General by the Contracting State on the territory of which the depositary institution is located and including a declaration of assurances to the effect that the said institution complies and will continue to comply with the requirements specified in Article 6(2). The said status may be acquired also by virtue of a written communication addressed to the Director General by an intergovernmental industrial property organization and including the said declaration.

(b) The communication shall also contain information on the depositary institution as provided in the Regulations and may indicate the date on which the status of international depositary authority should take effect.

(2)*(a)* If the Director General finds that the communication includes the required declaration and that all the required information has been received, the communication shall be promptly published by the International Bureau.

(b) The status of international depositary authority shall be acquired as from the date of publication of the communication or, where a date has been indicated under paragraph (1)*(b)* and such date is later than the date of publication of the communication, as from such date.

(3) The details of the procedure under paragraphs (1) and (2) are provided in the Regulations.

Article 8

Termination and Limitation of the Status of International Depositary Authority

(1)*(a)* Any Contracting State or any intergovernmental industrial property organization may request the Assembly to terminate, or to limit to certain kinds of microorganisms, any authority's status of international depositary authority on the ground that the requirements specified in Article 6 have not been or are no longer complied with. However, such a request may not be made by a Contracting State or intergovernmental industrial property organization in respect of an international depositary authority for which it has made the declaration referred to in Article 7(1)*(a)*.

(b) Before making the request under subparagraph *(a)*, the Contracting State or the intergovernmental industrial property organization shall, through the intermediary of the Director General, notify the reasons for the proposed request to the Contracting State or the intergovernmental industrial property organization which has made the communication referred to in Article 7(1) so that that State or organization may, within six months from the date of the said notification, take appropriate action to obviate the need for making the proposed request.

(c) Where the Assembly finds that the request is well founded, it shall decide to terminate, or to limit to certain kinds of microorganisms, the status of international depositary authority of the authority referred to in subparagraph *(a)*. The decision of the Assembly shall require that a majority of two-thirds of the votes cast be in favor of the request.

(2)*(a)* The Contracting State or intergovernmental industrial property organization having made the declaration referred to in Article 7(1)*(a)* may, by a communication addressed to the Director General, withdraw its declaration either entirely or in respect only of certain kinds of microorganisms and in any event shall do so when and to the extent that its assurances are no longer applicable.

(b) Such a communication shall, from the date provided for in the Regulations, entail, where it relates to the entire declaration, the termination of the status of international depositary authority or, where it relates only to certain kinds of microorganisms, a corresponding limitation of such status.

(3) The details of the procedure under paragraphs (1) and (2) are provided in the Regulations.

Article 9

Intergovernmental Industrial Property Organizations

(1)*(a)* Any intergovernmental organization to which several States have entrusted the task of granting regional patents and of which all the member States are members of the International (Paris) Union for the Protection of Industrial Property may file with the Director General a declaration that it accepts the obligation of recognition provided for in Article 3(1)*(a)*, the obligation concerning the requirements referred to in Article 3(2) and all the effects of the provisions of this Treaty and the Regulations applicable to intergovernmental industrial property organizations. If filed before the entry into force of this Treaty according to Article 16(1), the declaration referred to in the preceding sentence shall become effective on the date of the said entry into force. If filed after such entry into force, the said declaration shall become effective three months after its filing unless a later date has been indicated in the declaration. In the latter case, the declaration shall take effect on the date thus indicated.

(b) The said organization shall have the right provided for in Article 3(1)*(b)*.

(2) Where any provision of this Treaty or of the Regulations affecting intergovernmental industrial property organizations is revised or amended, any

intergovernmental industrial property organization may withdraw its declaration referred to in paragraph (1) by notification addressed to the Director General. The withdrawal shall take effect:

(i) where the notification has been received before the date on which the revision or amendment enters into force, on that date;

(ii) where the notification has been received after the date referred to in (i), on the date indicated in the notification or, in the absence of such indication, three months after the date on which the notification was received.

(3) In addition to the case referred to in paragraph (2), any intergovernmental industrial property organization may withdraw its declaration referred to in paragraph (1)*(a)* by notification addressed to the Director General. The withdrawal shall take effect two years after the date on which the Director General has received the notification. No notification of withdrawal under this paragraph shall be receivable during a period of five years from the date on which the declaration took effect.

(4) The withdrawal referred to in paragraph (2) or (3) by an intergovernmental industrial property organization whose communication under Article 7(1) has led to the acquisition of the status of international depositary authority by a depositary institution shall entail the termination of such status one year after the date on which the Director General has received the notification of withdrawal.

(5) Any declaration referred to in paragraph (1)*(a)*, notification of withdrawal referred to in paragraph (2) or (3), assurances furnished under Article 6(1), second sentence, and included in a declaration made in accordance with Article 7(1)*(a)*, request made under Article 8(1) and communication of withdrawal referred to in Article 8(2) shall require the express previous approval of the supreme governing organ of the intergovernmental industrial property organization whose members are all the States members of the said organization and in which decisions are made by the official representatives of the governments of such States.

CHAPTER II

ADMINISTRATIVE PROVISIONS

Article 10

Assembly

(1)*(a)* The Assembly shall consist of the Contracting States.

(b) Each Contracting State shall be represented by one delegate, who may be assisted by alternate delegates, advisors, and experts.

(c) Each intergovernmental industrial property organization shall be represented by special observers in the meetings of the Assembly and any committee and working group established by the Assembly.

(d) Any State not member of the Union which is a member of the Organization or of the International (Paris) Union for the Protection of Industrial Property and any intergovernmental organization specialized in the field of patents other than an intergovernmental industrial property organization as defined in Article 2(v) may be represented by observers in the meetings of the Assembly and, if the Assembly so decides, in the meetings of any committee or working group established by the Assembly.

(2)*(a)* The Assembly shall:

(i) deal with all matters concerning the maintenance and development of the Union and the implementation of this Treaty;

(ii) exercise such rights and perform such tasks as are specially conferred upon it or assigned to it under this Treaty;

(iii) give directions to the Director General concerning the preparations for revision conferences;

(iv) review and approve the reports and activities of the Director General concerning the Union, and give him all necessary instructions concerning matters within the competence of the Union;

(v) establish such committees and working groups as it deems appropriate to facilitate the work of the Union;

(vi) determine, subject to paragraph (1)*(d)*, which States other than Contracting States, which intergovernmental organizations other than intergovernmental industrial property organizations as defined in Article 2(v) and which international non-governmental organizations shall be admitted to its meetings as observers and to what extent international depositary authorities shall be admitted to its meetings as observers;

(vii) take any other appropriate action designed to further the objectives of the Union;

(viii) perform such other functions as are appropriate under this Treaty.

(b) With respect to matters which are of interest also to other Unions administered by the Organization, the Assembly shall make its decisions after having heard the advice of the Coordination Committee of the Organization.

(3) A delegate may represent, and vote in the name of, one State only.

(4) Each Contracting State shall have one vote.

(5)*(a)* One-half of the Contracting States shall constitute a quorum.

(b) In the absence of the quorum, the Assembly may make decisions but, with the exception of

decisions concerning its own procedure, all such decisions shall take effect only if the quorum and the required majority are attained through voting by correspondence as provided in the Regulations.

(6)*(a)* Subject to Articles 8(1)*(c)*, 12(4) and 14(2)*(b)*, the decisions of the Assembly shall require a majority of the votes cast.

(b) Abstentions shall not be considered as votes.

(7)*(a)* The Assembly shall meet once in every third calendar year in ordinary session upon convocation by the Director General, preferably during the same period and at the same place as the General Assembly of the Organization.

(b) The Assembly shall meet in extraordinary session upon convocation by the Director General, either on his own initiative or at the request of one-fourth of the Contracting States.

(8) The Assembly shall adopt its own rules of procedure.

Article 11

International Bureau

(1) The International Bureau shall:

(i) perform the administrative tasks concerning the Union, in particular such tasks as are specifically assigned to it under this Treaty and the Regulations or by the Assembly;

(ii) provide the secretariat of revision conferences, of the Assembly, of committees and working groups established by the Assembly, and of any other meeting convened by the Director General and dealing with matters of concern to the Union.

(2) The Director General shall be the chief executive of the Union and shall represent the Union.

(3) The Director General shall convene all meetings dealing with matters of concern to the Union.

(4)*(a)* The Director General and any staff member designated by him shall participate, without the right to vote, in all meetings of the Assembly, the committees and working groups established by the Assembly, and any other meeting convened by the Director General and dealing with matters of concern to the Union.

(b) The Director General, or a staff member designated by him, shall be ex officio secretary of the Assembly, and of the committees, working groups and other meetings referred to in subparagraph *(a)*.

(5)*(a)* The Director General shall, in accordance with the directions of the Assembly, make the preparations for revision conferences.

(b) The Director General may consult with intergovernmental and international non-governmental organizations concerning the preparations for revision conferences.

(c) The Director General and persons designated by him shall take part, without the right to vote, in the discussions at revision conferences.

(d) The Director General, or a staff member designated by him, shall be ex officio secretary of any revision conference.

Article 12

Regulations

(1) The Regulations provide rules concerning:

(i) matters in respect of which this Treaty expressly refers to the Regulations or expressly provides that they are or shall be prescribed;

(ii) any administrative requirements, matters or procedures;

(iii) any details useful in the implementation of this Treaty.

(2) The Regulations adopted at the same time as this Treaty are annexed to this Treaty.

(3) The Assembly may amend the Regulations.

(4)*(a)* Subject to subparagraph *(b)*, adoption of any amendment of the Regulations shall require two-thirds of the votes cast.

(b) Adoption of any amendment concerning the furnishing of samples of deposited microorganisms by the international depositary authorities shall require that no Contracting State vote against the proposed amendment.

(5) In the case of conflict between the provisions of this Treaty and those of the Regulations, the provisions of this Treaty shall prevail.

CHAPTER III

REVISION AND AMENDMENT

Article 13

Revision of the Treaty

(1) This Treaty may be revised from time to time by conferences of the Contracting States.

(2) The convocation of any revision conference shall be decided by the Assembly.

(3) Articles 10 and 11 may be amended either by a revision conference or according to Article 14.

Article 14

Amendment of Certain Provisions of the Treaty

(1)*(a)* Proposals under this Article for the amendment of Articles 10 and 11 may be initiated by any Contracting State or by the Director General.

(b) Such proposals shall be communicated by the Director General to the Contracting States at least six months in advance of their consideration by the Assembly.

(2)*(a)* Amendments to the Articles referred to in paragraph (1) shall be adopted by the Assembly.

(b) Adoption of any amendment to Article 10 shall require four-fifths of the votes cast; adoption of any amendment to Article 11 shall require three-fourths of the votes cast.

(3)*(a)* Any amendment to the Articles referred to in paragraph (1) shall enter into force one month after written notifications of acceptance, effected in accordance with their respective constitutional processes, have been received by the Director General from three-fourths of the Contracting States members of the Assembly at the time the Assembly adopted the amendment.

(b) Any amendment to the said Articles thus accepted shall bind all the Contracting States which were Contracting States at the time the amendment was adopted by the Assembly, provided that any amendment creating financial obligations for the said Contracting States or increasing such obligations shall bind only those Contracting States which have notified their acceptance of such amendment.

(c) Any amendment which has been accepted and which has entered into force in accordance with subparagraph *(a)* shall bind all States which become Contracting States after the date on which the amendment was adopted by the Assembly.

CHAPTER IV

FINAL PROVISIONS

Article 15

Becoming Party to the Treaty

(1) Any State member of the International (Paris) Union for the Protection of Industrial Property may become party to this Treaty by:

(i) signature followed by the deposit of an instrument of ratification, or

(ii) deposit of an instrument of accession.

(2) Instruments of ratification or accession shall be deposited with the Director General.

Article 16

Entry Into Force of the Treaty

(1) This Treaty shall enter into force, with respect to the first five States which have deposited their instruments of ratification or accession, three months after the date on which the fifth instrument of ratification or accession has been deposited.

(2) This Treaty shall enter into force with respect to any other State three months after the date on which that State has deposited its instrument of ratification or accession unless a later date has been indicated in the instrument of ratification or accession. In the latter case, this Treaty shall enter into force with respect to that State on the date thus indicated.

Article 17

Denunciation of the Treaty

(1) Any Contracting State may denounce this Treaty by notification addressed to the Director General.

(2) Denunciation shall take effect two years after the day on which the Director General has received the notification.

(3) The right of denunciation provided for in paragraph (1) shall not be exercised by any Contracting State before the expiration of five years from the date on which it becomes party to this Treaty.

(4) The denunciation of this Treaty by a Contracting State that has made a declaration referred to in Article 7(1)*(a)* with respect to a depositary institution which thus acquired the status of international depositary authority shall entail the termination of such status one year after the day on which the Director General received the notification referred to in paragraph (1).

Article 18

Signature and Languages of the Treaty

(1)*(a)* This Treaty shall be signed in a single original in the English and French languages, both texts being equally authentic.

(b) Official texts of this Treaty shall be established by the Director General, after consultation with the interested Governments and within two months from the date of signature of this Treaty, in the other languages in which the Convention Establishing the World Intellectual Property Organization was signed.

(c) Official texts of this Treaty shall be established by the Director General, after consultation with the interested Governments, in the Arabic, German, Italian, Japanese and Portuguese languages, and such other languages as the Assembly may designate.

(2) This Treaty shall remain open for signature at Budapest until December 31, 1977.

Article 19

Deposit of the Treaty; Transmittal of Copies; Registration of the Treaty

(1) The original of this Treaty, when no longer open for signature, shall be deposited with the Director General.

(2) The Director General shall transmit two copies, certified by him, of this Treaty and the Regulations to the Governments of all the States referred to in Article 15(1), to the intergovernmental organizations that may file a declaration under Article 9(1)*(a)* and, on request, to the Government of any other State.

(3) The Director General shall register this Treaty with the Secretariat of the United Nations.

(4) The Director General shall transmit two copies, certified by him, of any amendment to this Treaty and to the Regulations to all Contracting States, to all intergovernmental industrial property organizations and, on request, to the Government of any other State and to any other intergovernmental organization that may file a declaration under Article 9(1)*(a)*.

Article 20

Notifications

The Director General shall notify the Contracting States, the intergovernmental industrial property organizations and those States not members of the Union which are members of the International (Paris) Union for the Protection of Industrial Property of:

(i) signatures under Article 18;

(ii) deposits of instruments of ratification or accession under Article 15(2);

(iii) declarations filed under Article 9(1)*(a)* and notifications of withdrawal under Article 9(2) or (3);

(iv) the date of entry into force of this Treaty under Article 16(1);

(v) the communications under Articles 7 and 8 and the decisions under Article 8;

(vi) acceptance of amendments to this Treaty under Article 14(3);

(vii) any amendment of the Regulations;

(viii) the dates on which amendments to the Treaty or the Regulations enter into force;

(ix) denunciations received under Article 17.

Regulations

Under the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure

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*This Table of Contents is added for the convenience of the reader *(Editor's note)*.

Rule 1

Abbreviated Expressions and Interpretation of the Word "Signature"

1.1 *"Treaty"*

In these Regulations, the word "Treaty" means the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure.

1.2 *"Article"*

In these Regulations, the word "Article" refers to the specified Article of the Treaty.

1.3 *"Signature"*

In these Regulations, whenever the word "signature" is used, it shall be understood that, where the law of the State on the territory of which an international depositary authority is located requires the use of a seal instead of a signature, the said word shall mean "seal" for the purposes of that authority.

Rule 2

International Depositary Authorities

2.1 *Legal Status*

Any international depositary authority may be a government agency, including any public institution attached to a public administration other than the central government, or a private entity.

2.2 *Staff and Facilities*

The requirements referred to in Article 6(2)(ii) shall include in particular the following:

(i) the staff and facilities of any international depositary authority must enable the said authority to store the deposited microorganisms in a manner which ensures that they are kept viable and uncontaminated;

(ii) any international depositary authority must, for the storage of microorganisms, provide for sufficient safety measures to minimize the risk of losing microorganisms deposited with it.

2.3 *Furnishing of Samples*

The requirements referred to in Article 6(2)(viii) shall include in particular the requirement that any international depositary authority must furnish samples of deposited microorganisms in an expeditious and proper manner.

Rule 3

Acquisition of the Status of International Depositary Authority

3.1 *Communication*

(a) The communication referred to in Article 7(1) shall be addressed to the Director General, in the case of a Contracting State, through diplomatic channels or, in the case of an intergovernmental industrial property organization, by its chief executive officer.

(b) The communication shall:

(i) indicate the name and address of the depositary institution to which the communication relates;

(ii) contain detailed information as to the said institution's capacity to comply with the requirements specified in Article 6(2), including information on its legal status, scientific standing, staff and facilities;

(iii) where the said depositary institution intends to accept for deposit only certain kinds of microorganisms, specify such kinds;

(iv) indicate the amount of any fees that the said institution will, upon acquiring the status of international depositary authority, charge for storage, viability statements and furnishing of samples of microorganisms;

(v) indicate the official language or languages of the said institution;

(vi) where applicable, indicate the date referred to in Article 7(1)*(b)*.

3.2 *Processing of the Communication*

If the communication complies with Article 7(1) and Rule 3.1, it shall be promptly notified by the Director General to all Contracting States and intergovernmental industrial property organizations and shall be promptly published by the International Bureau.

3.3 *Extension of the List of Kinds of Microorganisms Accepted*

The Contracting State or intergovernmental industrial property organization having made the communication referred to in Article 7(1) may, at any time thereafter, notify the Director General that its assurances are extended to specified kinds of microorganisms to which, so far, the assurances have not extended. In such a case, and as far as the additional kinds of microorganisms are concerned, Article 7 and Rules 3.1 and 3.2 shall apply, *mutatis mutandis*.

Rule 4

Termination or Limitation of the Status of International Depositary Authority

4.1 *Request; Processing of Request*

(a) The request referred to in Article 8(1)*(a)* shall be addressed to the Director General as provided in Rule 3.1*(a)*.

(b) The request shall:

(i) indicate the name and address of the international depositary authority concerned;

(ii) where it relates only to certain kinds of microorganisms, specify such kinds;

(iii) indicate in detail the facts on which it is based.

(c) If the request complies with paragraphs *(a)* and *(b)*, it shall be promptly notified by the Director General to all Contracting States and intergovernmental industrial property organizations.

(d) Subject to paragraph *(e)*, the Assembly shall consider the request not earlier than six and not later than eight months from the notification of the request.

(e) Where, in the opinion of the Director General, respect of the time limit provided for in paragraph *(d)* could endanger the interests of actual or potential depositors, he may convene the Assembly for a date earlier than the date of the expiration of the six-month period provided for in paragraph *(d)*.

(f) If the Assembly decides to terminate, or to limit to certain kinds of microorganisms, the status of international depositary authority, the said decision shall become effective three months after the date on which it was made.

4.2 *Communication; Effective Date; Processing of Communication*

(a) The communication referred to in Article 8(2)*(a)* shall be addressed to the Director General as provided in Rule 3.1*(a)*.

(b) The communication shall:

(i) indicate the name and address of the international depositary authority concerned;

(ii) where it relates only to certain kinds of microorganisms, specify such kinds;

(iii) where the Contracting State or intergovernmental industrial property organization making the communication desires that the effects provided for in Article 8(2)*(b)* take place on a date later than at the expiration of three months from the date of the communication, indicate that later date.

(c) Where paragraph *(b)*(iii) applies, the effects provided for in Article 8(2)*(b)* shall take place on the date indicated under that paragraph in the communication; otherwise, they shall take place at the expiration of three months from the date of the communication.

(d) The Director General shall promptly notify all Contracting States and intergovernmental industrial property organizations of any communication received under Article 8(2) and of its effective date under paragraph *(c)*. A corresponding notice shall be promptly published by the International Bureau.

4.3 *Consequences for Deposits*

In the case of a termination or limitation of the status of international depositary authority under Articles 8(1), 8(2), 9(4) or 17(4), Rule 5.1 shall apply, *mutatis mutandis*.

Rule 5

Defaults by the International Depositary Authority

5.1 *Discontinuance of Performance of Functions in Respect of Deposited Microorganisms*

(a) If any international depositary authority temporarily or definitively discontinues the performance of any of the tasks it should perform under the Treaty and these Regulations in relation to any microorganisms deposited with it, the Contracting State or intergovernmental industrial property organization which, in respect of that authority, has furnished the assurances under Article 6(1) shall:

(i) ensure, to the fullest extent possible, that samples of all such microorganisms are transferred promptly and without deterioration or contamination from the said authority ("the defaulting authority") to another international depositary authority ("the substitute authority");

(ii) ensure, to the fullest extent possible, that all mail or other communications addressed to the defaulting authority, and all files and other relevant information in the possession of that authority, in respect of the said microorganisms are promptly transferred to the substitute authority;

(iii) ensure, to the fullest extent possible, that the defaulting authority promptly notifies all depositors affected of the discontinuance of the performance of its functions and the transfers effected;

(iv) promptly notify the Director General of the fact and the extent of the discontinuance in question and of the measures which have been taken by the said Contracting State or intergovernmental industrial property organization under (i) to (iii).

(b) The Director General shall promptly notify the Contracting States and the intergovernmental industrial property organizations as well as the industrial property offices of the notification received under paragraph *(a)*(iv); the notification of the Director General and the notification received by him shall be promptly published by the International Bureau.

(c) Under the applicable patent procedure it may be required that the depositor shall, promptly after receiving the receipt referred to in Rule 7.5, notify to any industrial property office with which a patent application was filed with reference to the original deposit the new accession number given to the deposit by the substitute authority.

(d) The substitute authority shall retain in an appropriate form the accession number given by the defaulting authority, together with the new accession number.

(e) In addition to any transfer effected under paragraph *(a)*(i), the defaulting authority shall, upon request by the depositor, transfer a sample of any microorganism deposited with it to any international depositary authority indicated by the depositor other

than the substitute authority, provided that the depositor pays any expenses to the defaulting authority resulting from the transfer of that sample. The depositor shall pay the fee for the storage of the said sample to the international depositary authority indicated by him.

(f) On the request of any depositor affected, the defaulting authority shall retain, as far as possible, samples of the microorganisms deposited with it.

5.2 *Refusal To Accept Certain Kinds of Microorganisms*

(a) If any international depositary authority refuses to accept for deposit any of the kinds of microorganisms which it should accept under the assurances furnished, the Contracting State or intergovernmental industrial property organization which, in respect of that authority, has made the declaration referred to in Article 7(1)*(a)* shall promptly notify the Director General of the relevant facts and the measures which have been taken.

(b) The Director General shall promptly notify the other Contracting States and intergovernmental industrial property organizations of the notification received under paragraph *(a)*; the notification of the Director General and the notification received by him shall be promptly published by the International Bureau.

Rule 6

Making the Original Deposit or New Deposit

6.1 *Original Deposit*

(a) The microorganism transmitted by the depositor to the international depositary authority shall, except where Rule 6.2 applies, be accompanied by a written statement bearing the signature of the depositor and containing:

(i) an indication that the deposit is made under the Treaty;

(ii) the name and address of the depositor;

(iii) details of the conditions necessary for the cultivation of the microorganism, for its storage and for testing its viability and also, where a mixture of microorganisms is deposited, descriptions of the components of the mixture and at least one of the methods permitting the checking of their presence;

(iv) an identification reference (number, symbols, etc.) given by the depositor to the microorganism;

(v) an indication of the properties of the microorganism which the international depositary authority cannot be expected to foresee but which are dangerous to health or the environment, particularly in the case of new microorganisms.

(b) It is strongly recommended that the written statement referred to in paragraph *(a)* should contain the scientific description and/or proposed taxonomic designation of the deposited microorganism.

6.2 *New Deposit*

(a) Subject to paragraph *(b)*, in the case of a new deposit made under Article 4, the microorganism transmitted by the depositor to the international depositary authority shall be accompanied by a copy of the receipt of the original deposit, a copy of the most recent statement concerning the viability of the microorganism originally deposited indicating that the microorganism is viable and a written statement bearing the signature of the depositor and containing:

(i) the indications referred to in Rule 6.1*(a)*(i) to (v);

(ii) a declaration stating the reason relevant under Article 4(1)*(a)* for making the new deposit, the statement required under Article 4(1)*(c)*, and, where applicable, an indication of the date relevant under Article 4(1)*(e)*;

(iii) where a scientific description and/or proposed taxonomic designation was/were indicated in connection with the original deposit, the most recent scientific description and/or proposed taxonomic designation as existing on the date relevant under Article 4(1)*(e)*.

(b) Where the new deposit is made with the international depositary authority with which the original deposit was made, paragraph *(a)*(i) shall not apply.

6.3 *Requirements of the International Depositary Authority*

(a) Any international depositary authority may require that the microorganism be deposited in the form and quantity necessary for the purposes of the Treaty and these Regulations and be accompanied by a form established by such authority and duly completed by the depositor for the purposes of the administrative procedures of such authority.

(b) Any international depositary authority shall communicate any such requirements and any amendments thereof to the International Bureau.

Rule 7

Receipt

7.1 *Issuance of Receipt*

The international depositary authority shall issue to the depositor, in respect of each deposit of microorganism effected with it or transferred to it, a receipt in attestation of the fact that it has received and accepted the microorganism.

7.2 *Form; Languages; Signature*

(a) Any receipt referred to in Rule 7.1 shall be established on a form called an "international form," a model of which shall be established by the Director General in those languages which the Assembly shall designate.

(b) Any words or letters filled in in the receipt in characters other than those of the Latin alphabet shall also appear therein transliterated in characters of the Latin alphabet.

(c) The receipt shall bear the signature of the person or persons having the power to represent the international depositary authority or that of any other official of that authority duly authorized by the said person or persons.

7.3 *Contents in the Case of the Original Deposit*

Any receipt referred to in Rule 7.1 and issued in the case of an original deposit shall indicate that it is issued by the depositary institution in its capacity of international depositary authority under the Treaty and shall contain at least the following indications:

(i) the name and address of the international depositary authority;

(ii) the name and address of the depositor;

(iii) the date of receipt of the microorganism by the international depositary authority;

(iv) the identification reference (number, symbols, etc.) given by the depositor to the microorganism;

(v) the accession number given by the international depositary authority to the deposit;

(vi) where the written statement referred to in Rule 6.1*(a)* contains the scientific description and/or proposed taxonomic designation of the microorganism, a reference to that fact.

7.4 *Contents in the Case of the New Deposit*

Any receipt referred to in Rule 7.1 and issued in the case of a new deposit effected under Article 4 shall be accompanied by a copy of the receipt of the original deposit and a copy of the most recent statement concerning the viability of the microorganism originally deposited indicating that the microorganism is viable, and shall at least contain:

(i) the indications referred to in Rule 7.3(i) to (v);

(ii) an indication of the relevant reason and, where applicable, the relevant date as stated by the depositor in accordance with Rule 6.2*(a)*(ii);

(iii) where Rule 6.2*(a)*(iii) applies, a reference to the fact that a scientific description and/or a proposed taxonomic designation has/have been indicated by the depositor;

(iv) the accession number given to the original deposit.

7.5 *Receipt in the Case of Transfer*

The international depositary authority to which samples of microorganisms are transferred under Rule 5.1*(a)*(1) shall issue to the depositor, in respect of each deposit in relation with which a sample is transferred, a receipt indicating that it is issued by the depositary institution in its capacity of international depositary authority under the Treaty and containing at least:

(i) the indications referred to in Rule 7.3(i) to (v);

(ii) the name and address of the international depositary authority from which the transfer was effected;

(iii) the accession number given by the international depositary authority from which the transfer was effected.

7.6 *Communication of the Scientific Description and/or Proposed Taxonomic Designation*

On request of any party entitled to receive a sample of the deposited microorganism under Rules 11.1, 11.2 or 11.3, the international depositary authority shall communicate to such party the scientific description and/or proposed taxonomic designation referred to in Rules 7.3(vi) or 7.4(iii).

Rule 8

Later Indication or Amendment of the Scientific Description and/or Proposed Taxonomic Designation

8.1 *Communication*

(a) Where, in connection with the deposit of a microorganism, the scientific description and/or taxonomic designation of the microorganism was/were not indicated, the depositor may later indicate or, where already indicated, may amend such description and/or designation.

(b) Any such later indication or amendment shall be made in a written communication, bearing the signature of the depositor, addressed to the international depositary authority and containing:

(i) the name and address of the depositor;

(ii) the accession number given by the said authority;

(iii) the scientific description and/or proposed taxonomic designation of the microorganism;

(iv) in the case of an amendment, the last preceding scientific description and/or proposed taxonomic designation.

8.2 *Attestation*

The international depositary authority shall, on the request of the depositor having made the communication referred to in Rule 8.1, deliver to him an attestation showing the data referred to in Rule 8.1*(b)*(i) to (iv) and the date of receipt of such communication.

Rule 9

Storage of Microorganisms

9.1 *Duration of the Storage*

Any microorganism deposited with an international depositary authority shall be stored by such authority, with all the care necessary to keep it viable and uncontaminated, for a period of at least five years after the most recent request for the furnishing of a

sample of the deposited microorganism was received by the said authority and, in any case, for a period of at least 30 years after the date of the deposit.

9.2 *Secrecy*

No international depositary authority shall give information to anyone whether a microorganism has been deposited with it under the Treaty. Furthermore, it shall not give any information to anyone concerning any microorganism deposited with it under the Treaty except to an authority, natural person or legal entity which is entitled to obtain a sample of the said microorganism under Rule 11 and subject to the same conditions as provided in that Rule.

Rule 10

Viability Test and Statement

10.1 *Obligation to Test*

The international depositary authority shall test the viability of each microorganism deposited with it:

(i) promptly after any deposit referred to in Rule 6 or any transfer referred to in Rule 5.1;

(ii) at reasonable intervals, depending on the kind of microorganism and its possible storage conditions, or at any time, if necessary for technical reasons;

(iii) at any time, on the request of the depositor.

10.2 *Viability Statement*

(a) The international depositary authority shall issue a statement concerning the viability of the deposited microorganism:

(i) to the depositor, promptly after any deposit referred to in Rule 6 or any transfer referred to in Rule 5.1;

(ii) to the depositor, on his request, at any time after the deposit or transfer;

(iii) to any industrial property office, other authority, natural person or legal entity, other than the depositor, to whom or to which samples of the deposited microorganism were furnished in conformity with Rule 11, on his or its request, together with or at any time after such furnishing of samples.

(b) The viability statement shall indicate whether the microorganism is or is no longer viable and shall contain:

(i) the name and address of the international depositary authority issuing it;

(ii) the name and address of the depositor;

(iii) the date of the deposit of the microorganism and of the transfer, if any;

(iv) the accession number given by the said authority;

(v) the date of the test to which it refers;

(vi) information on the conditions under which the viability test has been performed, provided that the said information has been requested by the party to which the viability statement is issued and that the results of the test were negative.

(c) In the cases of paragraph *(a)* (ii) and (iii), the viability statement shall refer to the most recent viability test.

(d) As to form, languages and signature, Rule 7.2 shall apply, *mutatis mutandis,* to the viability statement.

(e) In the case of paragraph *(a)* (i) or where the request is made by an industrial property office, the issuance of the viability statement shall be free of charge. Any fee payable under Rule 12.1*(a)* (iii) in respect of any other viability statement shall be chargeable to the party requesting the statement and shall be paid before or at the time of making the request.

Rule 11

Furnishing of Samples

11.1 *Furnishing of Samples to Interested Industrial Property Offices*

Any international depositary authority shall furnish a sample of any deposited microorganism to the industrial property office of any Contracting State or of any intergovernmental industrial property organization, on the request of such office, provided that the request shall be accompanied by a declaration to the effect that:

(i) an application referring to the deposit of that microorganism has been filed with that office for the grant of a patent and that the subject matter of that application involves the said microorganism or the use thereof;

(ii) such application is pending before that office or has led to the grant of a patent;

(iii) the sample is needed for the purposes of a patent procedure having effect in the said Contracting State or in the said organization or its member States;

(iv) the said sample and any information accompanying or resulting from it will be used only for the purposes of the said patent procedure.

11.2 *Furnishing of Samples to or with the Authorization of the Depositor*

Any international depositary authority shall furnish a sample of any deposited microorganism:

(i) to the depositor, on his request;

(ii) to any authority, natural person or legal entity (hereinafter referred to as "the authorized party"), on the request of such party, provided that the request is accompanied by a declaration of the depositor authorizing the requested furnishing of a sample.

11.3 *Furnishing of Samples to Parties Legally Entitled*

(a) Any international depositary authority shall furnish a sample of any deposited microorganism to any authority, natural person or legal entity (hereinafter referred to as "the certified party"), on the

request of such party, provided that the request is made on a form whose contents are fixed by the Assembly and that on the said form the industrial property office certifies:

(i) that an application referring to the deposit of that microorganism has been filed with that office for the grant of a patent and that the subject matter of that application involves the said microorganism or the use thereof;

(ii) that, except where the second phrase of (iii) applies, publication for the purposes of patent procedure has been effected by that office;

(iii) *either* that the certified party has a right to a sample of the microorganism under the law governing patent procedure before that office and, where the said law makes the said right dependent on the fulfillment of certain conditions, that that office is satisfied that such conditions have actually been fulfilled *or* that the certified party has affixed his signature on a form before that office and that, as a consequence of the signature of the said form, the conditions for furnishing a sample to the certified party are deemed to be fulfilled in accordance with the law governing patent procedure before that office; where the certified party has the said right under the said law prior to publication for the purposes of patent procedure by the said office and such publication has not yet been effected, the certification shall expressly state so and shall indicate, by citing it in the customary manner, the applicable provision of the said law, including any court decision.

(b) In respect of patents granted and published by any industrial property office, such office may from time to time communicate to any international depositary authority lists of the accession numbers given by that authority to the deposits of the microorganisms referred to in the said patents. The international depositary authority shall, on the request of any authority, natural person or legal entity (hereinafter referred to as "the requesting party"), furnish to it a sample of any microorganism where the accession number has been so communicated. In respect of deposited microorganisms whose accession numbers have been so communicated, the said office shall not be required to provide the certification referred to in Rule 11.3*(a)*.

11.4 *Common Rules*

(a) Any request, declaration, certification or communication referred to in Rules 11.1, 11.2 and 11.3 shall be

(i) in English, French, Russian or Spanish where it is addressed to an international depositary authority whose official language is or whose official languages include English, French, Russian or Spanish, respectively, provided that, where it must be in Russian or Spanish, it may be instead filed in English or French and, if it is so filed, the International Bureau shall, on the request of the interested party referred to in the said Rules or the international depositary authority, establish, promptly and free of charge, a certified translation into Russian or Spanish;

(ii) in all other cases, it shall be in English or French, provided that it may be, instead, in the official language or one of the official languages of the international depositary authority.

(b) Notwithstanding paragraph *(a)*, where the request referred to in Rule 11.1 is made by an industrial property office whose official language is Russian or Spanish, the said request may be in Russian or Spanish, respectively, and the International Bureau shall establish, promptly and free of charge, a certified translation into English or French, on the request of that office.

(c) Any request, declaration, certification or communication referred to in Rules 11.1, 11.2 and 11.3 shall be in writing, shall bear a signature and shall be dated.

(d) Any request, declaration or certification referred to in Rules 11.1, 11.2 and 11.3*(a)* shall contain the following indications:

(i) the name and address of the industrial property office making the request, of the authorized party or of the certified party, as the case may be;

(ii) the accession number given to the deposit;

(iii) in the case of Rule 11.1, the date and number of the application or patent referring to the deposit;

(iv) in the case of Rule 11.3*(a)*, the indications referred to in (iii) and the name and address of the industrial property office which has made the certification referred to in the said Rule.

(e) Any request referred to in Rule 11.3*(b)* shall contain the following indications:

(i) the name and address of the requesting party;

(ii) the accession number given to the deposit.

(f) The container in which the sample furnished is placed shall be marked by the international depositary authority with the accession number given to the deposit and shall be accompanied by a copy of the receipt referred to in Rule 7.

(g) The international depositary authority having furnished a sample to any interested party other than the depositor shall promptly notify the depositor in writing of that fact, as well as of the date on which the said sample was furnished and of the name and address of the industrial property office, of the authorized party, of the certified party or of the requesting party, to whom or to which the sample was furnished. The said notification shall be accompanied by a copy of the pertinent request, of any declarations submitted under Rules 11.1 or 11.2(ii) in connection with the said request, and of any forms or requests bearing the signature of the requesting party in accordance with Rule 11.3.

(h) The furnishing of samples referred to in Rule 11.1 shall be free of charge. Where the

furnishing of samples is made under Rule 11.2 or 11.3, any fee payable under Rule 12.1*(a)*(iv) shall be chargeable to the depositor, to the authorized party, to the certified party or to the requesting party, as the case may be, and shall be paid before or at the time of making the said request.

Rule 12
Fees

12.1 *Kinds and Amounts*

(a) Any international depositary authority may, with respect to the procedure under the Treaty and these Regulations, charge a fee:

(i) for storage;

(ii) for the attestation referred to in Rule 8.2;

(iii) subject to Rule 10.2*(e)*, first sentence, for the issuance of viability statements;

(iv) subject to Rule 11.4*(h)*, first sentence, for the furnishing of samples.

(b) The fee for storage shall be for the whole duration of the storage of the microorganism as provided in Rule 9.1.

(c) The amount of any fee shall not vary on account of the nationality or residence of the depositor or on account of the nationality or residence of the authority, natural person or legal entity requesting the issuance of a viability statement or furnishing of samples.

12.2 *Change in the Amounts*

(a) Any change in the amount of the fees charged by any international depositary authority shall be notified to the Director General by the Contracting State or intergovernmental industrial property organization which made the declaration referred to in Article 7(1) in respect of that authority. The notification may, subject to paragraph *(c)*, contain an indication of the date from which the new fees will apply.

(b) The Director General shall promptly notify all Contracting States and intergovernmental industrial property organizations of any notification received under paragraph *(a)* and of its effective date under paragraph *(c)*; the notification of the Director General and the notification received by him shall be promptly published by the International Bureau.

(c) Any new fees shall apply as of the date indicated under paragraph *(a)*, provided that, where the change consists of an increase in the amounts of the fees or where no date is so indicated, the new fees shall apply as from the thirtieth day following the publication of the change by the International Bureau.

Rule 13
Publication by the International Bureau

13.1 *Form of Publication*

Any publication by the International Bureau referred to in the Treaty or these Regulations shall be made in the monthly periodical of the International Bureau referred to in the Paris Convention for the Protection of Industrial Property.

13.2 *Contents*

(a) At least in the first issue of each year of the said periodical, an up-to-date list of the international depositary authorities shall be published, indicating in respect of each such authority the kinds of microorganisms that may be deposited with it and the amount of the fees charged by it.

(b) Full information on any of the following facts shall be published once, in the first issue of the said periodical published after the occurrence of the fact:

(i) any acquisition, termination or limitation of the status of international depositary authority, and the measures taken in connection with that termination or limitation;

(ii) any extension referred to in Rule 3.3;

(iii) any discontinuance of the functions of an international depositary authority, any refusal to accept certain kinds of microorganisms, and the measures taken in connection with such discontinuance or refusal;

(iv) any change in the fees charged by an international depositary authority;

(v) any requirements communicated in accordance with Rule 6.3*(b)* and any amendments thereof.

Rule 14
Expenses of Delegations

14.1 *Coverage of Expenses*

The expenses of each delegation participating in any session of the Assembly and in any committee, working group or other meeting dealing with matters of concern to the Union shall be borne by the State or organization which has appointed it.

Rule 15
Absence of Quorum in the Assembly

15.1 *Voting by Correspondence*

(a) In the case provided for in Article 10(5)*(b)*, the Director General shall communicate any decision of the Assembly (other than decisions relating to the Assembly's own procedure) to the Contracting States which were not represented when the decision was made and shall invite them to express in writing their vote or abstention within a period of three months from the date of the communication.

(b) If, at the expiration of the said period, the number of Contracting States having thus expressed their vote or abstention attains the number of Contracting States which was lacking for attaining the quorum when the decision was made, that decision shall take effect provided that at the same time the required majority still obtains.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 2, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-23-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-3-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-1-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-23-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-19-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-8-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	4-28-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-14-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-12-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-2-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	11-17-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-14-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-29-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-6-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	4-14-70
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	11-24-76

Expiration of patents: The patents within the range of numbers indicated below expire during July 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the ran. of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,943,327 to 2,947,000, inclusive
Plant Patents..... Numbers 1,957 to 1,962, inclusive

REISSUES

AUGUST 23, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

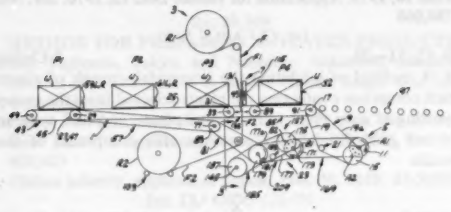
Re. 29,362
PACKAGING APPARATUS

Laurie M. Reid, Birmingham, Ala., assignor to Anderson Bros. Mfg. Co., Rockford, Ill.

Original No. 3,927,507, dated Dec. 23, 1975, Ser. No. 435,731, Jan. 23, 1974. Application for reissue June 29, 1976, Ser. No. 700,797

Int. Cl.[2] **B65B** *11/10, 13/04, 51/14*

U.S. Cl. 53—198 R **9 Claims**



1. Packaging apparatus comprising means for feeding forward units to be wrapped and flexible packaging material for wrapping the units, with the units spaced apart in the direction of feed, means for effecting intermittent operation of the feeding means intermittently to feed forward the units and the packaging material, with a dwell interval between successive feed cycles, and means for forming a seal across the width of the material between two successive units during each dwell interval, wherein said means for operating the feeding means comprises a chain and sprocket drive including a crank rotatable about a predetermined axis, means for continuously rotating the crank in one direction about its said axis, a first sprocket secured to the crank with the axis of said first sprocket offset from the crank axis for rotation of said first sprocket about the crank axis without rotation of said first sprocket about its own axis, a second sprocket connected to said feeding means, a chain trained around said first and second sprockets, said first sprocket acting to pull a reach of the chain in a forward direction to effect rotation of the second sprocket in a forward direction for driving said feed means during a first portion of a revolution of said first sprocket about the crank axis, and to discontinue [froward] *forward* drive of the chain during a second portion of said revolution for a feed and dwell of the feed means during each revolution of the crank, means for maintaining the chain relatively taut around said sprockets, and means driven in timed relation to said first sprocket for operating said seal forming means to form a seal as the first sprocket rotates through said second portion of a revolution.

Re. 29,363
FALSE-TWIST TEXTURING YARN OF POLYESTER FILAMENTS HAVING MULTILOBAL CROSS SECTIONS

Jerry Bruce McKay, Kinston, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

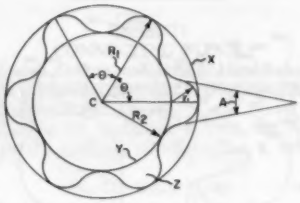
Original No. 3,846,969, dated Nov. 12, 1974, Ser. No. 393,167, Aug. 30, 1973. Continuation-in-part of Ser. No. 243,795, April 13, 1972, abandoned, which is a continuation-in-part of Ser. No. 99,446, Dec. 18, 1970, abandoned. Application for reissue Nov. 11, 1975, Ser. No. 631,128.

The portion of the term of this patent subsequent to Sept. 19, 1989, has been disclaimed.

Int. Cl.[2] **D02G** *3/02, 1/02*

U.S. Cl. 57—140 J **10 Claims**

1. An improvement in multifilament polyester yarn for false-twist texturing [at a maximum ratio (R) of output-to-input of up to 6:1,] wherein the improvement comprises yarn composed of polyester filaments of multilobal cross-section characterized by a total number (N) of 6 to 10 essentially symmetric lobes of substantially equal length, equispaced radially about



the center of the filament, and having between 1.17 and 1.85 modification ratio (M), the filaments having a denier per filament between 3.8[(R)] and (5.88M − 10 + N)[(R).] *at M = 1.85.*

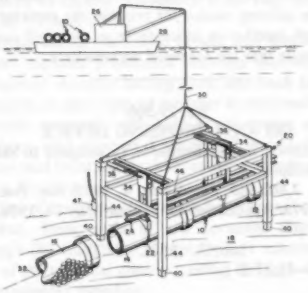
Re. 29,364
METHOD OF SUBMARINE PIPE LAYING

Spencer H. Robley, deceased, late of La Crescenta, Calif., assignor to Underwater Devices, Inc., Sherman Oaks, Calif.

Original No. 3,267,682, dated Aug. 23, 1966, Ser. No. 419,693, Dec. 21, 1964. Continuation-in-part of Ser. No. 319,126, Oct. 28, 1963, Pat. No. 3,204,417. Application for reissue Dec. 14, 1976, Ser. No. 752,241

Int. Cl.[2] **F16L** *1/00*

U.S. Cl. 61—111 **5 Claims**



1. The method of laying pipe on the floor under a body of water, comprising the steps of: releasably securing a length of pipe to a mobile frame; lowering said frame and pipe in said body of water to a stable position wherein said frame is supported securely by and in fixed relation to said floor with said length of pipe generally aligned with but spaced from the end of a pipeline already on said floor; moving at least a portion of said length of pipe, laterally of its length and relative to said frame, while holding the same secured thereto and supported thereby to bring the axis of said length of pipe into a desired and stable relation to the axis of said pipeline; and then moving said length of pipe axially, relative to said frame while holding the same secured thereto and supported thereby, into engagement with the end of said pipeline to form a continuation thereof.

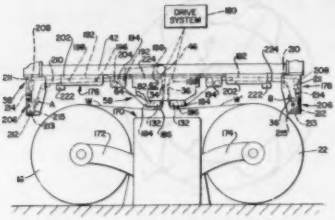
Re. 29,365
WEB SUPPLY APPARATUS

Richard A. Butler Jr., Chestnut Hill, Mass., assignor to Butler Automatic, Inc., Canton, Mass.

Original No. 3,858,819, dated Jan. 7, 1975, Ser. No. 299,713, Oct. 24, 1972. Application for reissue May 17, 1976, Ser. No. 687,260

Int. Cl.[2] B65H *19/14, 19/20*

U.S. Cl. 242—58.3 22 Claims



20. Web supply apparatus comprising

A. a web accumulator;

B. a splicing station located directly underneath the accumulator that is not readily accessible to an operator;

C. a pair of roll stands of the roll-out type for supporting a pair of web rolls one of which is expiring into the accumulator, the other of which is at the ready, each said stand being movable generally parallel to the axes of the rolls between said splicing station and a loading station adjacent the accumulator that is readily accessible to the operator,

D. positioning means supported on each roll stand for positioning the leading edge of the ready web when the roll stand supporting the ready web is located at its loading station;

E. means supporting the roll stand containing the ready web for movement to the splicing station so that the leading edge of the ready web is positioned directly opposite the expiring web, and

F. means permanently suspended from the overhead accumulator at the splicing station for pressing the expiring web and ready web together to splice them so that web can proceed continuously into the overhead accumulator.

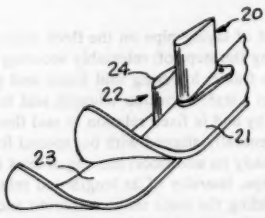
Re. 29,366
SKI ANTI-CROSSING DEVICE

Hugo V. Giannotti, E. Patchogue, N.Y., assignor to Ski Dynamics, Inc., Bellport, N.Y.

Original No. 3,863,943, dated Feb. 4, 1975, Ser. No. 400,027, Sept. 24, 1973. Application for reissue May 14, 1976, Ser. No. 686,504

Int. Cl.[2] A63C *11/00*

U.S. Cl. 280—11.37 E 6 Claims



7. Means for attachment to the upper surfaces adjacent an end of skis comprising a first base plate, mounted on a first ski, a first member pivotally mounted on said first base plate,

a second base plate mounted on a second ski, a second member pivotally mounted on said second base plate, said members being pivoted about an axis generally parallel to the upper surfaces of said skis and generally longitudinally thereof,

said members being spring loaded to the vertical position, each said member being adapted to block the other ski from crossing it but yielding in the direction that will unblock the other ski if the other ski has cross a member.

Re. 29,367
FLUOROALKOXYPHENYL-SUBSTITUTED NITROGEN HETEROCYCLES AS PLANT STUNTING AGENTS

Robert Lee Benefiel, Manilla, and Eriks Viktors Krumkalns, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Original No. 3,967,949, dated July 6, 1976, Ser. No. 371,106, June 18, 1973. Application for reissue Dec. 13, 1976, Ser. No. 750,060

Int. Cl.[2] A01N *5/00*

U.S. Cl. 71—76 9 Claims

1. A method of inhibiting the internodal growth of plants which comprises contacting the plants selected from the group consisting of crop plants, ornamental plants, and turf, with an effective growth-inhibiting amounts of a compound of the formula

wherein

R is 5-pyrimidinyl;

R^1 is isopropyl;

R^2 is trifluoromethoxyphenyl, tetrafluoroethoxyphenyl or pentafluoroethoxyphenyl;

X is hydroxy;

and the nonphytotoxic acid addition salts thereof.

Re. 29,368
METAL-ORGANO COMPOUNDS WITH STERICALLY EXPOSED METAL-METAL BONDS, AND A METHOD FOR THEIR PRODUCTION

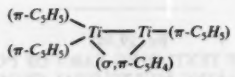
Guido P. Pez, Boonton, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Original No. 3,776,932, dated Dec. 4, 1973, Ser. No. 180,144, Sept. 13, 1971. Application for reissue Nov. 13, 1975, Ser. No. 631,777

Int. Cl.[2] C07F *7/00, 7/28*

U.S. Cl. 260—429.3 16 Claims

25. A metal-organo complex having the structural formula



and giving the infrared spectrum represented by the upper curve of the accompanying drawing and giving the X-ray diffraction data shown in the herein table of Bragg spacing and relative intensity.

27. A method for preparing a metal-organo complex having at least one sterically exposed metal-metal bond having the structure:

$$R_nM \quad M'R_n$$

wherein R represents the cyclopentadienyl ligand; n is an integer of from 1 to 3; M and M' each represent the same or a different transition metal selected from the group consisting of titanium, zirconium, hafnium, molybdenum and tungsten; and the symbol

represents a single or multiple, sterically exposed metal-metal bond, which comprises:

(a) admixing a halogenide of the metal-organo compound selected to supply the desired ligand, with a cold substantially dry, oxygen-free ethereal solvent solution of potassium, sodium or lithium naphthalene at a temperature between −200° C. and −25° C. in a reaction vessel from which air or oxygen has been removed or replaced with an inert atmosphere, and agitating the mixture for at least 2 hours;

(b) gradually warming the reaction mixture during a period of at least one hour to substantially ambient temperature;

(c) removing the ethereal solvent and excess naphthalene at temperatures under 40° C.; and

(d) extracting the residue at a temperature not exceeding 40° C. to obtain the metal-organo complex.

Re. 29,369

METHOD FOR PREPARING ACYLATED PRODUCTS

Yasuo Fujimoto, Tokyo, and Nobuhiro Nakamizo, Machida, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Original No. 3,867,424, dated Feb. 18, 1975, Ser. No. 49,918, June 25, 1970. Application for reissue Feb. 13, 1976, Ser. No. 658,039

Claims priority, application Japan, June 30, 1969, 44-51061

Int. Cl.[2] C07C *125/06*

U.S. Cl. 260—471 C **5 Claims**

1. In the process for preparing a carboxylic acid amide wherein a primary or secondary amine selected from alkylamines, arylamines and substituted arylamines is acylated with an ester derived from aliphatic or aromatic carboxylic acid, the improvement which comprises carrying out said acylation in the presence of an alkali-metal salt, an alkaline earth metal salt [of] *or* a quaternary ammonium salt of a compound containing a pyridine nucleus directly substituted by a hydroxy group [,] *or*a mercapto group, [or a group selected from] *and optionally by at least one member selected from the group consisting of* alkyl groups having **1** to **6** carbon atoms, aryl groups, aralkyl groups, *lower* alkoxy groups [having **1** to **6** carbon atoms] , nitro groups, [and] cyano groups *and an unsubstituted benzene ring which is fused to the pyridine nucleus.*

Re. 29,370

THERMOPLASTIC FILM PRODUCTION

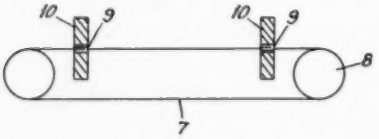
Denis James Henry Sandiford, Welwyn, and John Alan Elliott Kail, Harpenden, both of England, assignors to Imperial Chemical Industries Limited, London, England

Original No. 3,470,274, dated Sept. 30, 1969, Ser. No. 568,958, July 29, 1966. Application for reissue July 21, 1971, Ser. No. 164,755

Claims priority, application United Kingdom, July 30, 1965, 32703/65; Jan. 24, 1966, 3101/66

Int. Cl.[2] B29F *3/06*

U.S. Cl. 264—22 **10 Claims**



1. A process for quenching a freshly extruded thermoplastic composition which comrises extruding a molten thermoplastic film forming polymeric composition on to a moving casting surface, depositing on the upper surface of the film an electrostatic charge from a wire electrode situated near to said film surface and maintained at a large electrostatic potential difference from the casting surface so that the film is caused to adhere to said casting surface, and maintaining said wire electrode substantially free from deposit arising from condensed vapors of volatile matter present in said film forming composition or the decomposition products of said volatile matter by continuously unwinding said wire electrode from a first reel positioned at one side of the die orifice from which the thermoplastic film is extruded, winding said wire on to a second reel positioned at the other side of the die orifice at a speed which prevents the dwell time of the wire electrode above the extruded film from being sufficient for substantially any deposit to accumulate on the said wire.

Re. 29,371

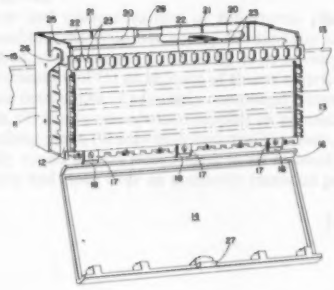
CONNECTING BLOCK

George De Bortoli, Ottawa, and Helmut Hans Lukas, Carleton Place, both of Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Original No. 3,784,728, dated Jan. 8, 1974, Ser. No. 308,054, Nov. 20, 1972. Application for reissue Jan. 8, 1976, Ser. No. 647,538

Int. Cl.[2] H01R *13/46*

U.S. Cl. 174—60 **8 Claims**



1. A connecting block for a telephone system, comprising:

a housing having a back member and two spaced apart side members extending forwardly from said back member, parallel to each other;

pivot means on forward ends of said side members;

a support member positioned between said side members, the support member having front and back faces;

pivot means on said support member at each end thereof and pivotally engaged with said pivot means on said side members, said support [members] *member* adapted to present said front and back faces alternatively in a forward facing direction;

a plurality of terminal clips extending through said support member, front ends of the terminal clips extending through the front face of the support member and back ends of the terminal clips extending through the back face of the support member;

a cover hingedly attached at its lower edge to a lower edge of said front face of said support member;

resilient clip means on an upper edge of said cover and engagement means on an upper edge of said front face of said support [means] *member*, the arrangement such that said resilient clip means engage with said engagement means when said front face of said support member is presented forward to retain said cover in position over said terminal clips;

stop means on said side members and said support [members] *member*, said stop means positioned to locate said support member in a predetermined position, said back face of the support member present in a forward direction; and

interengaging means on said cover and said housing adapted to retain said support member in said predetermined position.

PLANT PATENTS

GRANTED AUGUST 23, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,093

NECTARINE TREE

Frederic W. Anderson, Merced, Calif., assignor to The Burchell Nursery, Inc., Modesto, Calif.

Filed Oct. 1, 1976, Ser. No. 728,622
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, which is large, vigorous, upright to spreading, medium in size and texture of the trunk and branches, foliated with large to medium size, medium thick, lanceolate, acutely pointed leaves having a crenate margin and globose glands, blooms mid-season with large flowers, and a regular and very productive bearer of large, symmetrical, globose, freestone fruit having yellow skin substantially overspread with red, and yellow flesh; the variety being particularly characterized by fruit embracing both the bright red exterior color and the firm flesh of the fruit of the Red Diamond nectarine, the seed parent, and the very firm flesh of the fruit of the Sun Grand nectarine, the pollen parent, but ripening about ten days earlier than said Sun Grand nectarine.

4,094

DOYLE'S BLACKBERRY

Thomas E. Doyle, 1600 Bedford Road, Washington, Ind. 47501

Filed Nov. 11, 1976, Ser. No. 741,115
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—46 **1 Claim**

1. A new and distinct variety of Blackberry plant most nearly resembling the Wild Blackberry substantially as shown and described, characterized particularly as to novelty by the unique combination of (1) an absence of thorns or prickles, (2) the common occurrence of palmately compound leaves having five leaflets, (3) sturdy canes which support an unusually large upright-arching plant, (4) unusually long trailing stems, and (5) substantially round berries which form in an unusually abundant quantity and ripen over an unusually extended period.

PATENTS

GRANTED AUGUST 23, 1977

ERRATA

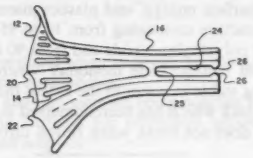
For CLASS	See PATENT NO.
066–170	4,043,142
073–486	4,043,218
081–177 A	4,043,239
038–102.91	4,043,270
138–031	4,043,352
273–138 R	4,043,406
181–117	4,043,420
350–162 SF	4,043,674
106–053	4,043,852
544–016	4,044,002
542–426	4,044,005
544–067	4,044,006
544–185	4,044,019
548–303	4,044,020
548–312	4,044,021
548–369	4,044,022
269–321 F	4,044,093
364–900	4,044,331
364–900	4,044,332
364–200	4,044,333
364–200	4,044,334
364–900	4,044,335
364–900	4,044,336
364–200	4,044,337
364–900	4,044,338

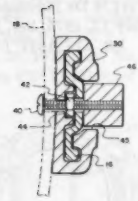
PATENTS

GRANTED AUGUST 23, 1977

GENERAL AND MECHANICAL

4,042,974
HELMET FACE GUARD ACCESSORY FOR MOTORCYCLE RIDERS
Clyde R. Morgan, Boring, and David C. Blocksom, Portland, both of Oreg., assignors to Wheelsport Distributing Co., Portland, Oreg.
Filed Oct. 14, 1975, Ser. No. 622,392
Int. Cl.[2] A41D *13/00*
U.S. Cl. 2—9 **6 Claims**





1. A face guard accessory adapted to be adjustably, removably and rigidly attached to a protective helmet for motorcycler's and the like for protecting and shielding the lower portions of the face of the user from airborne particles comprising:

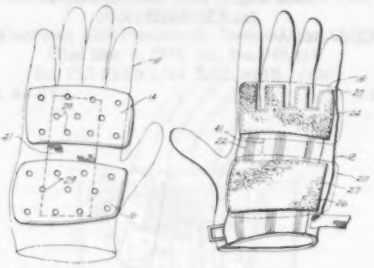
a. a perforated shield portion of substantially rigid material having multiple apertures formed therein for covering the lower portion of the face of said user while permitting comfortable access to breathing air through said apertures;

b. a pair of elongate substantially rigid side members connected to said shield portion and extending rearwardly therefrom for supporting said shield portion, each said side member having a longitudinal slot formed therein having an open end at the rearmost end of said side member, said slot extending forwardly from said open end a predetermined distance;

c. a pair of anchoring clamps for fastening said side members to the respective sides of said helmet, each said clamp having mating means for slidably engaging a slotted end of a respective one of said side members and constraining the movement of said side member to rectilinear sliding movement in a predetermined direction with respect to said helmet and including an outwardly protruding threaded post positioned so as to extend through said slot when said respective side member is slidably engaged with said mating means; and

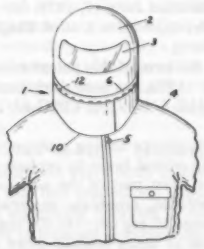
d. a respective manually-tightenable threaded securing means attached to the outer end of each of said threaded posts for selectively rigidly fastening said side members to said clamps at any of a plurality of sliding positions by the tightening of said securing means into engagement with the portions of said side members located on either side of said slot when said side members are slidably engaged with said mating means and, by the loosening of said securing means, for releasing said side members to permit said sliding movement and removal of said side members from said mating means.

4,042,975
MEANS FOR PROTECTING BATTERS FROM HAND INJURIES
Albert Winslow Elliott, Jr., Costa Mesa, and Albert W. Elliott, III, Long Beach, both of Calif., assignors to New Products Development, Inc., Downey, Calif.
Filed Apr. 1, 1976, Ser. No. 672,651
Int. Cl.[2] A41D *13/08*
U.S. Cl. 2—19 **41 Claims**



1. The combination comprising a pair of gloves for covering the right and left hands, in which each glove has a rear surface covering the back side of the hand and the rear surface has a lower portion covering the metacarpal area of the hand and an upper portion covering the lower portions of the fingers, first attachment means secured to the lower portion of one of said gloves for releasably attaching a first protective device to that portion of the glove; second attachment means secured to the upper portion of said one glove for releasably attaching a second protective device to that portion of the glove; third attachment means secured to the lower portion of the other of said gloves for releasably attaching a third protective device to that portion of the glove; and fourth attachment means secured to the upper portion of said other glove for releasably attaching a fourth protective device to that portion of the glove.

4,042,976
PROTECTIVE COLLAR
Jay Carter Reynolds, 134 E. Columbia, Shreveport, La. 71104
Filed Feb. 12, 1976, Ser. No. 657,574
Int. Cl.[2] A41B *3/16*
U.S. Cl. 2—135 **8 Claims**



1. A protective collar comprising:

a. A length of protective material for encircling the neck of

a wearer and having closure means on the inside perimeter of the top, the front side of one end, and the rear side of the opposite end thereof for mating said front side and said rear side; and

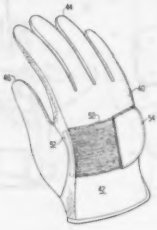
b. A water seal flap fastened to and encircling a head covering and having a cooperating flap closure means facing outwardly of said head covering for mating with said closure means on said inside perimeter of the top of said protective material and securing said protective collar to said water seal flap when said head covering is worn and said protective collar is fitted around the bottom of said head covering and the neck of a wearer.

4,042,977

GLOVE

Anthony J. Antonious, 7005 Lachlan Circle, Baltimore, Md. 21239

Filed Aug. 7, 1975, Ser. No. 602,709
Int. Cl.[2] A41D *19/00*
U.S. Cl. 2—161 A **6 Claims**



1. In a glove comprising a flexible body with a palm portion, a back portion covering the entire back of the hand, finger stalls, and a thumb stall, the improvement comprising:

a. a first elastic means secured to the glove fabric at or in proximity to the base of the thumb stall;

b. a first tab attached directly to the first elastic means at the end thereof remote from the thumb stall and having a hook and pile fastener undersurface; and

c. a mating hook and pile fastener surface on the glove in position to unite with the hook and pile fastener undersurface on the first tab when the first elastic means is stretched, whereby, when the first elastic means is stretched and the hook and pile fastener surfaces are united, the thumb stall is maintained taut and thumb droop is prevented.

4,042,978

PROSTHETICS

Michael Edward Benet Jones; Eileen Jones, and Joseph Franciszek Jaworzyn, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 368,199, June 8, 1973, Pat. No. 3,908,201. This application June 11, 1975, Ser. No. 585,868
Claims priority, application United Kingdom, June 30, 1972, 30766/72
The portion of the term of this patent subsequent to Sept. 30, 1992, has been disclaimed.
Int. Cl.[2] A61F *1/24, 1/00;* **C08G** *63/18;* **C08L** *63/10*
U.S. Cl. 3—1 **17 Claims**

1. A prosthetic device having a shape suitable for insertion into a human or animal body to replace a part thereof, said device having at least part of the surface thereof made of a plastic, water-soluble, non-toxic material having a surface energy in the range 50 erg cm^{-2} to 100 erg cm^{-2} whereby said device is capable of being bonded more strongly to collagenous body tissue than corresponding devices which do not have such a surface energy, said plastic material being a copolymer of poly(ethylene) glycol and bis(β-hydroxy) isophthalate, the copolymer comprising at least 10% by weight of units having the structure $CH_2—CH_2—O$ and no more than 95% by weight of said units and having a reduced viscosity measured on a 1% weight/volume solution in o-chlorphenol at 25° C in the range 0.4 $dl.g^{-1}$ to 2.0 $dl.g^{-1}$, wherein said polymeric material being stable in water to the extent that a film of material 0.5 mm. thick which has been immersed in water at 37° C for 24 hours does not break when flexed through 180°.

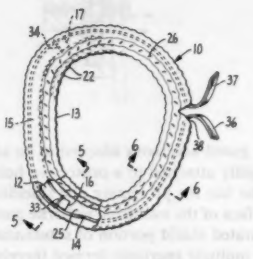
8. A prosthetic device having a shape suitable for insertion into a human or animal body to replace a part thereof, said device having at least part of the surface thereof made of a plastic, water-soluble, non-toxic material having a surface energy in the range 50 erg cm^{-2} to 100 erg cm^{-2} whereby said device is capable of being bonded more strongly to collagenous body tissue than corresponding devices which do not have such a surface energy, said plastics materal comprising a polymeric structure containing from 10 to 95% by weight of units of solid polyethylene oxide and from 90 to 5% of units of a polymerized methacrylate monomer wherein said plastics material being stable in water to the extent that a film of material 0.5 mm thick which has been immersed in water at 37+ C for 24 hours does not break when flexed through 180°.

4,042,979

VALVULOPLASTY RING AND PROSTHETIC METHOD

William W. Angell, 19174 De Haviland, San Jose, Calif. 95070

Filed July 12, 1976, Ser. No. 704,542
Int. Cl.[2] A61F *1/22*
U.S. Cl. 3—1.5 **13 Claims**



1. Adjustable valvuloplasty ring for an atrioventricular orifice comprising:

a. a frame that is sized and shaped to extend about a significant portion of the circumference of the orifice;

b. an expandable member extending from the ends of the frame that is sized and shaped to extend about at least a substantial portion of the remainder of the circumference of the orifice; and

c. means for expanding and contracting the expandable member whereby the size of the ring and orifice may be adjusted.

4,042,980

ENDOPROSTHETIC SHOULDER JOINT DEVICE

Sydney Alan Vasey Swanson, Carshalton, and Brian Arnold Roper, London, both of England, assignors to National Research Development Corporation, London, England

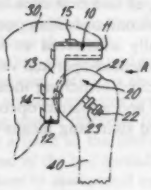
Filed Mar. 10, 1976, Ser. No. 665,574
Claims priority, application United Kingdom, Mar. 13, 1975, 10540/75
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 **8 Claims**

1. An endoprosthetic shoulder joint device, comprising:

a humeral component including a bearing part defining a substantially part-spherical, convex bearing surface

and a scapular component including a generally L-shaped member having one arm of said L-shaped member longer than the other such arm, having its inner face formed to

define a substantially part-spherical, concave bearing surface of which at least part lies in said one arm, and having said one arm of cranked form at least in its outer face;



said bearing surfaces being engaged for mutual articulation between said components;

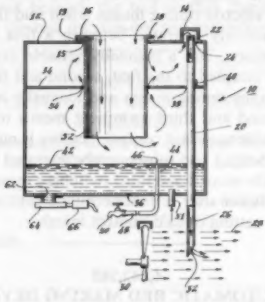
and said part and said member being adapted remotely from said bearing surfaces for respective securement to the humerus and scapular.

4,042,981

TOILET WASTE HOLDING APPARATUS

John Walter Cook, Garner, N.C., assignor to North American Philips Corporation, New York, N.Y.

Filed Sept. 29, 1975, Ser. No. 617,988
Int. Cl.[2] E03D *9/04*
U.S. Cl. 4—10 **5 Claims**



1. A toilet waste holding apparatus for a vehicle comprising:

a tank comprising

a top and a bottom, the top having a vent opening therethrough,

a horizontal partition dividing the tank into upper and lower tanks, said partition and tank top having aligned openings therethrough, said lower tank being arranged to receive a store of liquid up to a normal liquid level,

a removable insert defining a waste receiving passage and extending above the tank top and through said aligned openings into said lower tank above the normal liquid level, said insert fitting loosely into said partition and tank top openings so as to permit air flow around the outside of said insert, and

means for positioning the insert with respect to the tank top,

means for allowing an overflow of liquid within the tank to flow onto the tank top,

a vent pipe connected to the tank so as to pass through the vent opening in the top, said opening being sufficiently large to permit air and gases to flow around the vent pipe, the vent pipe having first and second ends, the first end being disposed above said tank top for carrying away air and gases released from any waste material in the tank and passing through said opening in the top between the top and the pipe, the second end extending below said tank bottom and having an angle cut in the end,

means, independent of vehicle motion, for blowing a stream of air past said second end so as to suck air and gases from within said vent pipe, and

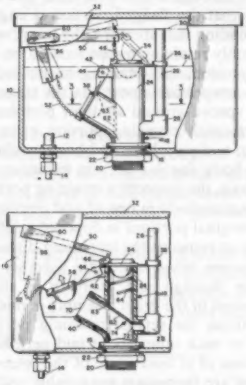
a vent pipe cap mounted over said first end and connected to the tank top around the vent opening such that suction in the vent pipe will pull air and gases flowing through the top opening around the pipe into the pipe while allowing any overflow of liquid to run across the tank top without entering the vent pipe.

4,042,982

FLUSH TOILET WATER CONSERVATION VALVE ASSEMBLY

Albert Contreras, 2230 Prospect St., National City, Calif. 92050

Filed Dec. 6, 1976, Ser. No. 748,119
Int. Cl.[2] E03D *1/34, 5/02;* **A61B** *19/00*
U.S. Cl. 4—67 A **9 Claims**



1. A flush toilet water conservation valve assembly for being connected in a water closet of a water closet type toilet bowl flushing system, comprising:

a flush valve body having a lower discharge connector end for being connected to the discharge opening of the flush tank,

said flush valve body having a first upwardly positioned water conduit and a second upwardly positioned water conduit,

said first and second conduits being joined at an intersection adjacent the connector end of the flush body,

said first conduit extending upwardly a greater distance than said second conduit, with each conduit having an open upper end, whereby a greater amount of flush water in the flush tank will flow into said first conduit than into said second conduit,

a centrally positioned upwardly extending overflow pipe connected to said flush valve body at a point adjacent the intersection of said first and second conduits,

first valve means selectively operable to open said first and second conduits at separate selective times,

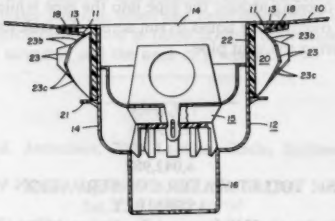
and second flapper valve means positioned in said first and second conduits at said intersection for selectively closing off reverse water flow from one of said conduits to the other of said conduits.

4,042,983

DRAIN ASSEMBLY FOR SINKS AND THE LIKE

John H. Carpentier, Fort Atkinson, Wis., assignor to Beatrice Foods Co., Chicago, Ill.

Filed May 26, 1976, Ser. No. 690,149
Int. Cl.[2] E03C *1/122*
U.S. Cl. 4—291 **15 Claims**



1. In a drain assembly for installation in the wall of a sink or the like, the assembly including a body having an annular portion with a retaining flanged portion at one end thereof and connectable at the other body end to a drain line, the body being insertable through a sink wall from one side of an aperture therein so that the flanged portion is engageable with a first area surrounding said aperture, the improvement comprising: drain assembly retaining means located on and around the body annular portion, the retaining means including at least two sets of discrete retaining portions, the retaining portions of each set being spaced around an outer periphery of the body annular portion, each retaining portion extending generally outwardly from said periphery and being resilient and flexible relative to the body annular portion in circumferential directions about its axis, the respective retaining portions of each set thereof taken successively in one of said circumferential directions having marginal portions in opposed relation to the body flanged portion at respectively increasing distances therefrom, the retaining means being insertable together with the body annular portion through said aperture as aforesaid upon a twisting movement of the drain assembly in one of said circumferential directions, the sets of retaining portions being disposed relative to each other about said periphery so that said marginal portions of at least some of the retaining portions in each set thereof are thereupon engageable with a second area surrounding said aperture effective to sealingly clamp the sink wall between the body flanged portion and said some of the retaining portions.

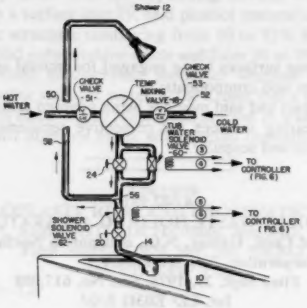
4,042,984

AUTOMATIC BATHTUB WATER LEVEL CONTROL SYSTEM

James L. Butler, Westlake Village, Calif., assignor to American Bath and Shower Corporation, Los Angeles, Calif.

Filed Dec. 31, 1975, Ser. No. 645,569
Int. Cl.[2] E03C *1/242*
U.S. Cl. 4—200 **9 Claims**

1. In combination: a bathtub; a water inlet pipe for supplying water to the bathtub; a temperature mixing valve coupling the water inlet pipe to hot water and to cold water supply pipes; a solenoid-operated valve coupled to the water inlet pipe to control the flow of water into the bathtub; a manually-operated valve coupled to the water inlet pipe in parallel with the solenoid-operated valve to control the flow of water into the bathtub independently of the solenoid-operated valve; a drain plug for draining water out of the bathtub; a solenoid-operated control mechanism mechanically coupled to the drain plug to open and close the drain plug; a manually-operated mechanism coupled to the drain plug to open and close the drain plug independently of the solenoid-operated control mechanism; and an electric control circuit connected to said solenoid-operated valve and to said solenoid-operated drain plug control mechanism, said electric control circuit including first switching means electrically connected to an energizing source and to said solenoid-operated drain plug mechanism selectively to connect said solenoid-operated drain plug mechanism to said energizing source to cause said solenoid-operated drain plug mechanism selectively to open and close the drain plug as said first switching means is operated between a first and second operating position, a second switching means electrically connected to said solenoid-operated valve to cause said solenoid-operated valve selectively to close and open as said second switching means is selectively operated between a first and a second operating position, electric timing means, a third switching means electrically connected



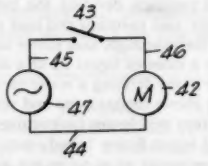
to said electric timing means selectively to de-energize and energize said electric timing means when said third switching means is selectively operated between a first and a second operating position, and a manually settable control member mechanically coupled to the first, second and third switching means and to the timing means and manually operable to set the first, second and third switching means to their second operating positions as said control member is manually moved to a selected setting and subsequently operated by said timing means to set the second and third switching means to their first operating position after a predetermined time interval established by the setting of said control member.

4,042,985

AUTOMATIC BED MAKING DEVICE

Mark B. Raczkowski, 55c Bruan Place, Clifton, N.J. 07012

Filed Nov. 13, 1975, Ser. No. 631,628
Int. Cl.[2] A47C *21/02*
U.S. Cl. 5—317 R **2 Claims**



1. A bed-making device for a bed having a bed frame supporting a mattress and bed spring, both the mattress and the bed springs having spaced opposite first and second ends, said mattress having an upper surface and said bed spring and mattress being supported by the bed frame in substantially horizonal positions, said bed-making device comprising:

a supporting structure affixed to the bed frame and positioned at the first and second ends of the mattress;

a first roller means rotatably mounted on the side of the supporting structure at the first end of the mattress, said first roller means having an axis substantially perpendicu-

lar to said supporting structure and being positioned with a part thereof, a maximum distance above a bed frame supporting structure, said part being substantially coplanar with the upper surface of the mattress and a second roller means rotatably mounted on the side of the supporting structure at the second end of the mattress, said second roller means being parallel to the first roller means and substantially coplanar therewith;

coupling means coupling the first and second roller means to each other for conjoint rotations about their axes;

a bed sheet having spaced opposite first and second ends;

a bed spread having spaced opposite first and second ends;

first fastener means affixed to the first end of the bed sheet and the second end of the bed spread, for affixing the first end of the bed sheet to the second end of the bed spread;

second fastener means affixed to the second end of the bed sheet and the first end of the bed spread, for affixing the second end of the bed sheet to the first end of the bed spread;

an endless loop formed by the bed sheet and bed spread affixed to each other by the first and second fastener means, being mounted on the roller means in a manner whereby part of said loop is on the upper surface of the mattress and part of said loop is beneath the bed springs;

a pillow removably affixed to the bed sheet in the area of one of the ends thereof;

a blanket removably affixed to the bed sheet and covering most of the said bed sheet;

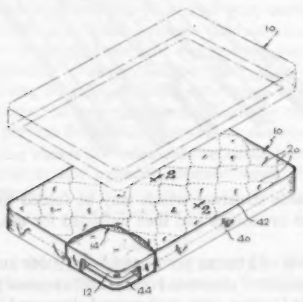
motive means drivingly coupled to the roller means for selectively rotating said roller means to selectively move the bed sheet and the affixed pillow and blanket to the upper surface of the mattress and simultaneously move the bed spread beneath the bed springs thereby selectively dressing the bed for non-use and preparing it for use.

4,042,986

BODY SUPPORTING AND CUSHIONING SURFACE FOR BEDDING

Steven J. Goodman, San Clemente, and Angel M. Echevarria, La Crescenta, both of Calif., assignors to Angel M. Echevarria, La Crescenta, Calif.

Filed Mar. 5, 1976, Ser. No. 664,252
Int. Cl.[2] A47G *9/00*
U.S. Cl. 5—335 **8 Claims**



1. A cushioning and support buffer surface having a quilted appearance for placement on the superior surface of a mattress to enhance uniformity, conformability response, and support for a user, comprising:

cellular foam panel means having a thickness of approximately ¾ to 1¼ inches and a density of from 0.5 to 2.0 lbs/cu. ft., said foam panel having a forcibly impacted structure and comprising a pair of cyclically impacted closed cell foam sheets of different densities, the lower sheet being of lesser thickness and greater density and the indentation load deflections of said sheets being less than 35;

superior surface ticking means and inferior surface porous backing means disposed on opposite sides of said panel means;

quilting stitch means areally unifying said ticking means and backing means to said panel means, and compressing said panel means along stitch lines; and

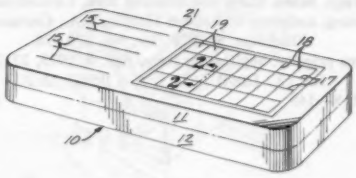
side border means coupled to said panel means and providing marginal restraint of said panel means to the associated mattress.

4,042,987

RESILIENT SUPPORT

John E. Rogers, Anaheim, Calif., assignor to Ronald J. P. Evans, Bushey Heath, England

Filed Apr. 16, 1976, Ser. No. 677,552
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—345 R **7 Claims**



1. In a resilient support pad adapted to support a human torso in a prone or reclining state the improvements comprising:

a plurality of first slits longitudinally formed in the surface of said pad subjacent the upper section of said torso;

a plurality of second slits formed in the surface of said pad subjacent the lower section of said torso, selected ones of said second slits being aligned to intersect selected other ones thereof; and

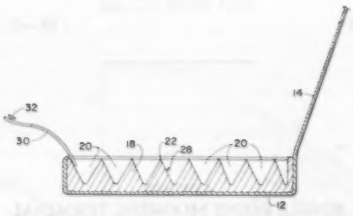
said first and second slits terminating within a predetermined distance of the periphery of said pad each extending into the interior of said pad to a predetermined depth for interrupting the transfer of stresses within said pad at the surfaces thereof.

4,042,988

AIR MATTRESS

Odell Holliday, 415 Washington Ave., Brooklyn, N.Y. 11238

Filed Nov. 2, 1976, Ser. No. 738,246
Int. Cl.[2] A47C *27/08*
U.S. Cl. 5—349 **8 Claims**



1. An air mattress construction comprising:

a. a hollow mattress enclosure including a planar top and means for releasably opening and closing same;

b. a plurality of elongated inflatable air tubes each having a first planar surface when inflated; and

c. a resilient support member insertable in said mattress enclosure and having the upper surface thereof corresponding to the top of the mattress and including means defining a plurality of elongated widthwise grooves

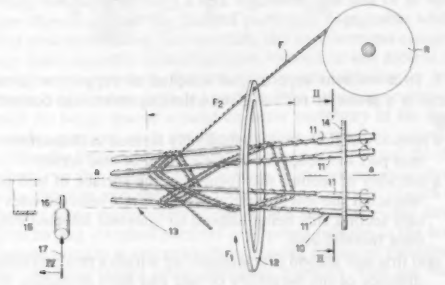
therein each receptive of one air tube to position the first planar surface thereof in the plane of the top of the mattress and means for releasably retaining the air tubes in their positions in the support member.

4,042,989

METHOD FOR PACKAGING AND DYEING YARNS AND YARN PACKAGING OBTAINED THEREBY

Leo Drago, Schio, Italy, and Edmond Ries, Luxembourg, Luxembourg, assignors to Robreli Holding S.A., Germany

Filed Apr. 8, 1976, Ser. No. 675,126
Claims priority, application Italy, Apr. 8, 1975, 22125/75
Int. Cl.[2] D06B *1/02, 23/04;* B65H *51/20*
U.S. Cl. 8—149 8 Claims



1. A method for packaging yarns, said method comprising the steps of providing a provisional core having an axis, winding at last one yarn onto said provisional core while simultaneously imparting to said yarn a continuous combined rotational movement about said provisional core and reciprocating movement longitudinally of said core axis, and continuously advancing the wound yarn along said core so that said yarn moves longitudinally of said core axis and comes off the end of said core remote from where said winding is effected.

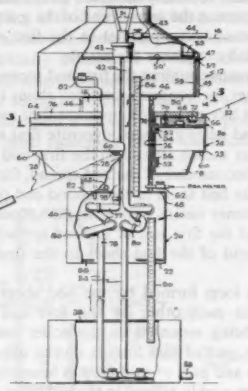
4,042,990

SINGLE POINT MOORING TERMINAL

Glenn B. Donaldson, Jr., 6952 Grovespring Drive, Rancho Palos Verdes, Calif. 90274

Continuation-in-part of Ser. No. 633,972, Nov. 21, 1975, abandoned. This application Sept. 27, 1976, Ser. No. 726,631
Int. Cl.[2] B63B *21/52, 35/44*
U.S. Cl. 9—8 P 48 Claims

1. A single point mooring system which comprises a first floating buoy having a downwardly depending elongated portion submerged in the water, a second submerged buoy positioned around said elongated portion of said first buoy, means anchoring said second buoy to the marine bottom, and means permitting vertical motion of said first buoy but restraining rotary motion thereof, said anchored second buoy also restraining said first buoy from lateral motion.

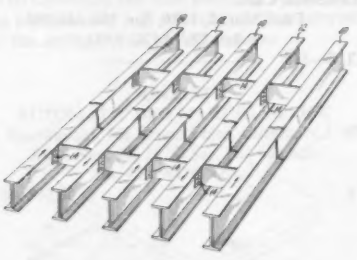


4,042,991

PARALLELOGRAM STRUCTURE

Robert L. Macy, and Joseph E. Zupanick, both of Richardson, Tex., assignors to Suntech, Inc., St. Davids, Pa.

Filed June 21, 1976, Ser. No. 698,443
Int. Cl.[2] E01D *15/2*
U.S. Cl. 14—1 5 Claims



1. A portable structure which may be folded together for transporation or storage and then unfolded for use, and comprising:

a. a plurality of I beams positioned side by side and having a first plurality of alternate I beams and a second plurality of alternate I beams, with each second alternate I beam being positioned adjacent to first alternate I beams; and

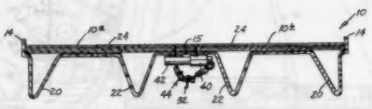
a. inclined pivot means for securing said plurality of I beams together such that the I beams may be folded together by having said first plurality of alternate I beams move relative to said second plurality of alternate I beams causing the top and bottom flanges of said first plurality of alternate I beams to rise over the top and bottom flanges of said adjacent plurality of second alternate I beams, and the same may be unfolded to form a structure wherein the tops of all of the plurality of I beams lie in the same plane, whereby the structure may be used as a load carrying structure.

4,042,992

PORTABLE REINFORCED LOADING RAMP

Robert C. Hyslop, Spokane, Wash., assignor to Herbert Management Co., Inc., Spokane, Wash.

Filed Aug. 30, 1976, Ser. No. 718,761
Int. Cl.[2] E01D *15/00*
U.S. Cl. 14—69.5 2 Claims



1. A portable reinforced loading ramp capable of being transversely expanded to load an automobile through a wide opening and of being transversely contracted to load dolly-supported freight through a narrow opening, comprising:

a first elongated body section having an outer raised side edge and an inner side face and integral reinforcing support ribs;

a second elongated body section having an outer raised side edge and an inner side face complementary to the inner side face of the first elongated body section and integral reinforcing supporting ribs;

interconnecting means operatively interconnecting the first and second body section with the inner side faces engaging when the ramp is in the contracted position;

said interconnecting means includes at least two alignment and locking assemblies mounted to the body section adjacent the inner side faces at longitudinally spaced locations for longitudinally aligning the body sections with respect to each other and for locking the body sections together with the inner side faces engaging when the ramp is in the contracted position;

wherein the interconnecting means includes parallel elongated mounting plates mounted to respective elongated body section adjacent the inner side faces and extending between the longitudinally spaced locations for supporting the alignment and locking assemblies rigidly to the body section;

each of said alignment and locking assemblies comprising;

1. a male shaft element mounted to one of the mounting plates and projecting therefrom transversely to the longitudinal direction of the one body section;
2. a female open-ended cylinder element mounted to the other mounting plate and directed transversely to the longitudinal direction of the other body section for receiving the male shaft element therein when the ramp is contracted to longitudinally align the body sections and prevent longitudinal movement therebetween; and
3. locking means for releasably securing the male shaft element in the cylinder element when the ramp is contracted.

4,042,993

POULTRY SHACKLE SCRUBBER

Curtis M. Cervin, 5253 Xerxes Ave. South, Minneapolis, Minn. 55410

Filed Oct. 5, 1976, Ser. No. 729,808
Int. Cl.[2] B65G *45/00;* A46B *13/02*
U.S. Cl. 15—21 D 10 Claims

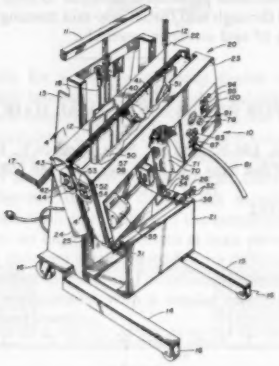
1. A scrubbing mechanism constructed and arranged for use with an overhead poultry or animal shackle conveying mechanism for continuously moving the shackles, said scrubbing mechanism comprising:

a. a vertical hoisting mechanism having a base member for supporting the same and having a platform extending therefrom operable to a selectable vertical position;

b. an elongated bifurcated frame secured to said hoisting mechanism platform at a predetermined incline with respect thereto, said bifurcated frame having a pair of elongated members spatially disposed from each other;

c. first rotary brush means with abrasive bristles having its axis of rotation extending substantially parallel to one of said pair of elongated members;

d. second rotary brush means with abrasive bristles substantially parallel to said first rotary brush means, said first and second rotary brush means rotating in opposite directions and disposed with respect to each other for a downward pulling engagement of at least one of such overhead shackles therebetween;



e. first and second guide bar means disposed beneath, and cooperating with, said first and second rotary brush means for aiding the movement of such shackles;

f. a plurality of output conduits disposed adjacent at least one of said first and second rotary brush means;

g. a plurality of liquids;

h. a liquid dispensing mechanism connected between said plurality of liquids and said plurality of output conduits;

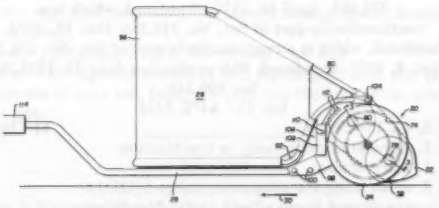
i. and a control mechanism operably connected to said liquid dispensing mechanism for controlling the selection of said plurality of liquids and intermittently controlling the quantity of each of said plurality of liquids dispensed through said plurality of output conduits.

4,042,994

SWEEPER ASSEMBLY

David S. Sassaman, Oshkosh, and Raymond F. McDonald, Winneconne, both of Wis., assignors to J. I. Case Company, Racine, Wis.

Filed Jan. 30, 1976, Ser. No. 654,248
Int. Cl.[2] E01H *1/04*
U.S. Cl. 15—83 8 Claims



1. A sweeper assembly, comprising:

a downwardly opening housing enclosure, a rotary sweeper brush rotatably mounted within said housing, a second rotary brush rotatably mounted within said housing generally parallel to said sweeper brush located adjacent and above said sweeper brush, means rotating said brushes to

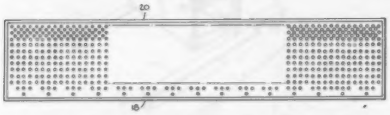
lift particulate material swept by said sweeper brush and propelled by said second brush through an opening said housing, a lower baffle means having an arcuate face spaced from and confronting said sweeper brush defining a throat between said sweeper brush and said housing directing particulate material collected by said sweeper brush into said housing enclosure, toward said secondary brush, and said lower baffle having a lower edge fixed relative to said housing and spaced below the rotational axis of said sweeper brush with said rotary brush spaced below said lower end, said baffle means lower end adapted to lift said sweeper assembly and lower brush upon engaging accumulated particulate material to limit the material received through said throat into said housing and prevent clogging of said sweeper assembly.

4,042,995

TOOL FOR REMOVING ANIMAL HAIR FROM CARPETING

Hyman Varon, 136 E. 76th St., New York, N.Y. 10021

Filed May 24, 1976, Ser. No. 688,958
Int. Cl.[2] A47L *13/00*
U.S. Cl. 15—142 **10 Claims**



1. A tool for removing animal hairs from carpet material comprising:

a head having a backboard, said head having a leading edge and a trailing edge, and

a field of bristles depending from said head,

a zone of said bristles along said trailing edge of said head being substantially more densely packed than the rest of said bristles in said field,

the ones of said bristles in a predetermined zone adjacent the leading edge of said head arranged such that the leading edge of said bristles has a saw tooth configuration, each of the bristles in the forwardmost row of bristles being substantially spaced from one another and defining the apex of a separate triangular wedge-like section of said saw tooth configuration.

4,042,996

AIR ETCHING OF POLYMERIC PRINTING PLATES

Forrest A. Wessells, Baltimore, and John E. Pickard, Ellicott City, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 388,234, Aug. 14, 1973, Pat. No. 3,922,751, which is a continuation-in-part of Ser. No. 351,415, April 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 316,253, Dec. 18, 1972, abandoned, which is a continuation-in-part of Ser. No. 178,723, Sept. 8, 1971, abandoned. This application June 25, 1975, Ser. No. 590,349
Int. Cl.[2] A47L *5/38*
U.S. Cl. 15—306 R **11 Claims**

1. Apparatus comprising, in combination

1. a first frame;

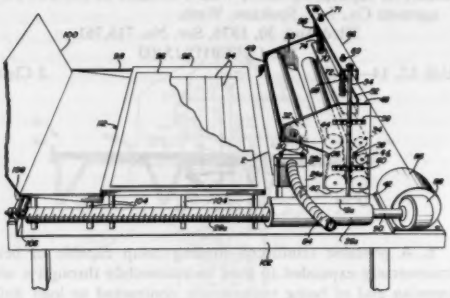
2. an air knife assembly comprising

a. a second frame affixed to the first frame,

b. an air knife carried in said second frame, said air knife consisting of an elongated hollow chamber containing a slit adapted to deliver air under pressure as a thin sheet;

c. means to deliver air under pressure to the air knife; and

3. A platen carried movably on said first frame and adapted to hold a relief letterpress plate having liquid polymer thereon; said platen carrying a sink on at least one of its sides to collect liquid blown from said plate by said air knife;



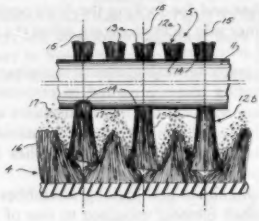
4. drive means adapted to move the platen under the air knife assembly in a work direction and to return the platen to its starting position.

4,042,997

VACUUM CLEANER WITH IMPROVED BRUSH

David E. McDowell, Grand Rapids, and Robert A. Yonkers, Grandville, both of Mich., assignors to Bissell, Inc., Grand Rapids, Mich.

Filed Oct. 29, 1976, Ser. No. 737,153
Int. Cl.[2] A47L *5/30*
U.S. Cl. 15—366 **5 Claims**



1. A vacuum cleaner comprising:

a. a head member adapted for reciprocable movement over a carpet,

b. an elongated carpet engaging nozzle disposed in said head member,

c. means for creating suction at the nozzlecarpet interface to move debris through said nozzle,

d. a handle on said head member,

e. and a rotatably driven brush disposed in said nozzle and engageable with the carpet, said brush comprising:

1. an elongated cylindrical core,

2. and a plurality of generally longitudinally extending circumferentially spaced rows of flexible brush bristle tufts extending radially outwardly from said core,

3. said tufts being of the same height and strength,

4. at least a portion of the tufts in alternate rows being equally and closely spaced a selected distance to form a substantially continuous line,

5. the tufts disposed circumferentially from said closely spaced tufts being widely and equally spaced at twice said selected distance,

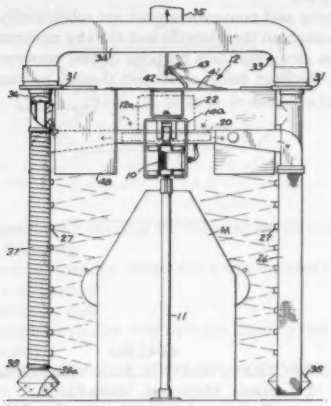
f. said widely spaced tufts forming means to penetrate the carpet in a discontinuous line during driven brush rotation to loosen deeply embedded debris and prepare the carpet surface for subsequent debris removal by said closely spaced tufts as said vacuum cleaner is moved across the carpet.

4,042,998

TEXTILE CLEANING

Ronald S. Blough, Sun City Center, Fla.; Virgil W. Cook, Charlotte, N.C., and Charles D. Spates, Fairfield, Iowa, assignors to American Chain & Cable Company, Inc., Bridgeport, Conn.

Filed Aug. 4, 1975, Ser. No. 601,658
Int. Cl.[2] A47L 9/20
U.S. Cl. 15—312 A 7 Claims



1. In a textile cleaning apparatus, the combination comprising

a track,

a carrier movable along said track adapted to extend along a row of textile machines,

means for driving said carrier along said track,

said carrier including blower means for directing a stream of air outwardly,

conduit means associated with said blower means for directing at least one stream of air onto the textile machines as the carrier moves along said track,

said carrier including air intake means associated with said blower means,

said air intake means including a chamber,

a connecting conduit communicating with said chamber and extending generally vertically alongside a row of machines,

said conduit having an outer wall,

a tubular filter within and spaced from said conduit with means associated with the lower end of the filter for closing the space between said filter and said conduit such that air and material drawn upwardly through the conduit pass along the inner periphery of the filter,

valve means associated with the upper end of the filter,

means associated with the upper end of the filter for closing the space between the filter and the conduit and cooperating with the valve means so that the air flowing upwardly through the interior of the filter must pass through the filter in order to move out of the conduit into said chamber,

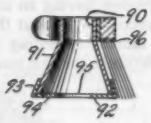
stationary means along the path of the track including a clean-out station connected to a source of vacuum such that as the carrier moves past the clean-out station, the upper end of the conduit associated with said clean-out station is brought into register with the clean-out station and the valve means at the upper end of the filter is actuated to permit the material deposited on the interior of the filter to be sucked upwardly into the clean-out station.

4,042,999

MINIATURIZED VACUUM CLEANER DEVICE

Demetrios Triantafyllou, 585 West End Ave., New York, N.Y. 10024

Filed Jan. 17, 1975, Ser. No. 541,763
Int. Cl.[2] A47L 9/02
U.S. Cl. 15—422 1 Claim



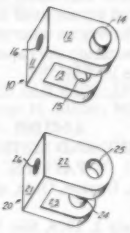
1. A nozzle for a vacuum cleaning device comprising: a relatively rigid tubular coupling member having a flared free end, a resilient flexible membrane of rubber-like material, said membrane including a peripherally-located contractal flange surrounding said free end, and a centrally disposed portion placed under tension by such engagement, there being a concentrically disposed opening in said last mentioned portion resiliently distortable in the plane of the membrane to conform sufficiently to an engaged object to at least partially seal said opening and maintain a sufficient pressure differential to allow said object to be retrieved; said membrane being removable for purposes of replacement with a similar membrane having a differently sized opening.

4,043,000

KNEE JOINT COUPLING

James W. Bunker, Saugus, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Filed June 14, 1976, Ser. No. 695,574
Int. Cl.[2] E05D 9/00
U.S. Cl. 16—128 R 5 Claims



1. A knee joint coupling comprising:

a first link and a second link;

each of said links having:

a base;

two legs extending from the base providing space therebetween;

a pin protruding from a first of said legs; and

a hole through the second of said legs aligned with said pin;

the pin of each link being inserted into the hole of the other link.

4,043,001

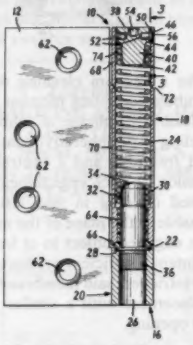
ADJUSTABLE SPRING HINGE

John S. Parsons, West Hartford, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Apr. 19, 1976, Ser. No. 678,435
Int. Cl.[2] E05F 1/12
U.S. Cl. 16—189 26 Claims

1. A spring hinge comprising a pair of adjacent hinge leaves; first and second hinge knuckles formed respectively on adjacent edges of the hinge leaves, the first hinge knuckle having

an aperture extending radially therethrough; a pintle extending into the hinge knuckles for mounting the knuckles in axial alignment; a torsion spring mechanism in the first hinge knuckle for urging the hinge leaves together, one end of the torsion spring mechanism being fixed for rotation relative to the first hinge knuckle; a capstan in the first hinge knuckle for non-rotatably fixing the other end of the torsion spring mechanism relative to the first hinge knuckle, the other end of the torsion spring mechanism having an anchoring turn wrapped substantially circumferentially about the capstan, the capstan having at least one radially extending cavity capable of being aligned with the aperture in the first hinge knuckle, a multiplicity of asperities disposed along an axial surface of the capstan, the anchoring turn of the torsion spring mechanism extending across and frictionally engaging the asperities to prevent rotation of the other end of the torsion spring mechanism relative to the capstan, and an annular channel forming a shoulder extending circumferentially around the capstan; and a ring secured in the aperture in the first hinge knuckle and extending into the first hinge knuckle for engaging the shoulder of the capstan to prevent axial movement of the capstan out of the first hinge knuckle and permit axial alignment of the aperture and cavity, the ring having an inner diameter of sufficient size to receive a pin for securing the capstan against rotation relative to the first hinge knuckle.

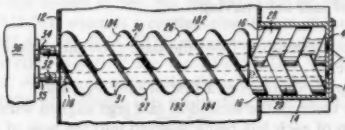


4,043,002

PATTY MACHINE AND METHOD OF FORMING PATTIES

Donald A. Brackman, Dayton, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed July 2, 1975, Ser. No. 592,530
Int. Cl.[2] A22C *11/08*
U.S. Cl. 17—32 **17 Claims**



1. In a machine for delivering in patty form controlled portions of a bulk product, including a feed hopper, a patty mold and means for charging said patty mold with said product to provide controlled portions thereof, product conveying means for conveying product from said hopper to said charging means comprising:

a plurality of conveyor screws positioned in said hopper and communicating with said charging means,

means mounting said conveyor screws for rotation about longitudinal axes thereof in a direction to convey product to said charging means,

each of said conveyor screws consisting of multiple flights of screw threads of substantially uniform size throughout the lengths of said screws,

said multiple flights of uniformly sized threads consisting of face portions and crest portions defined substantially by the intersections of said face portions,

said conveyor screws being intermeshed throughout their lengths, and

said crest portions of said conveyor screws being disposed in wiping relationship to said face portions of said conveyor screws,

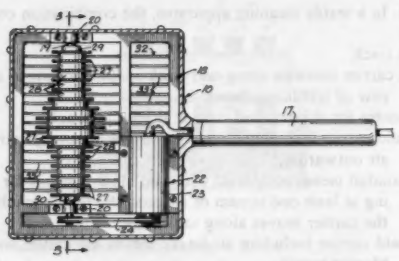
whereby said conveyor screws are substantially self-wiping throughout their lengths and thereby minimize accumulation along said face portions of said convevor screws of the product being conveyed thereby or components of said product.

4,043,003

BONE SECTIONING TOOL FOR VERTEBRATE FISH

George H. Lemmon, Hagerman, Idaho 83332

Filed Aug. 4, 1976, Ser. No. 711,510
Int. Cl.[2] A22C *25/16*
U.S. Cl. 17—67 **4 Claims**



1. A bone sectioning tool for severing the rib bones of vertebrate fish without damaging the flesh, comprising:

a frame;

an elongated arbor shaft rotatably mounted to the frame;

a plurality of circular saw blades mounted to the arbor shaft for coaxial rotation therewith;

spacer discs on the shaft between adjacent saw blades for spacing the blades substantially equally apart, and wherein each disc has a diameter slightly less than the diameters of adjacent saw blades;

wherein the saw blades and discs are of varying diameters and are arranged on the arbor shaft increasing in diameter toward the longitudinal center of the arbor shaft to complement the cross-sectional curvature of the splayed sides of an eviscerated vertebrate fish and to substantially limit the depth of cut of the blades;

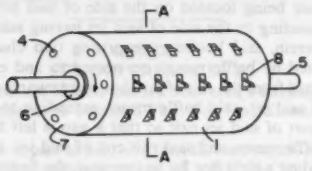
leaf spring members between adjacent blades and adjacent the blade periphery for preventing binding of rib bones between adjacent blades and for preventing the blades from substantially penetrating into the flesh while severing the bones; and

drive means for rotating the shaft and blades to cut the rib bones into short ingestible sections of lengths equal to the spacing between the saw blades.

4,043,004
RETRACTING TOOTH PROCESSING CYLINDER APPARATUS

Craig L. Folk, New Orleans, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 6, 1976, Ser. No. 656,031
Int. Cl.[2] D02J *7/00*
U.S. Cl. 19—200 6 Claims

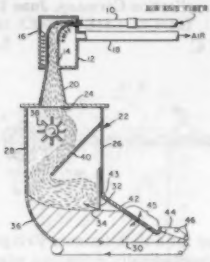


1. An apparatus for opening and cleaning textile stock comprising the following:
   a. a horizontal rotatable retractable tooth cylinder comprising in combination:
      1. a stationary cam;
      2. a rotatable cylinder, said cylinder housing said stationary cam;
      3. a plurality of teeth caged by said rotatable cylinder each tooth comprising:
         a. a working part to comb textile stock;
         b. a return arm which rides the surface of the cam and limits the travel of the tooth;
         c. an inside peripheral surface of each tooth which critically matches the surface of the cam thus forming an interface between said inside peripheral surface of said tooth and said surface of said cam;
      4. said plurality of teeth caged in a plurality of slots in said rotatable cylinder, each slot caging an individual tooth, and said teeth designed to turn freely on a pin,
      5. said pin acting as a journal or pivot for each tooth;
      6. said pin also acts as a retainer for a set of end caps which are retained by said pins and close the ends of the rotatable retractable tooth cylinder, each end cap comprising in combination:
         a. a bearing in the center of said end cap to allow for rotational movement;
      7. a shaft affixed to the ends of the stationary cam, said shaft passing through and supported by said bearing in said end caps, said shaft off-set equally on each end from the center of the cam thereby producing the desired critical interval or working conditions resulting from the outer rotational cylinder turning around the stationary internal cam and the freely turning teeth rotating on the pivot pin thus resulting in protraction and retraction of the teeth into and out of the rotatable cylinder slots as the tooth return arm and the critical tooth peripheral surface rides the outer surface of the stationary cam;
   b. a horizontal feed roller and a pressure plate, in substantial horizontal proximity to said horizontal rotatable retractable tooth cylinder;
   c. a feed chute, which deposits textile stock between said roller, said pressure plate, and said rotatable retractable tooth cylinder, where said textile stock is combined, opened, and extracted by said teeth of said rotatable retractable tooth cylinder;
   d. a trash collection hopper into which trash falls from said opened textile stock, said hopper located adjacent to and below said rotatable cylinder to receive and collect said trash;
   e. a chute into which said clean textile stock falls after being transported thereto by said retractable teeth and said retractable teeth retract.

4,043,005
PROCESS FOR FORMING A STAPLE FIBER BATT

Rashmikant Maganlal Contractor, Wilmington, and Sang-Hak Hwang, Newark, both of Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 577,C56, May 13, 1975, Pat. No. 3,981,047.
This application June 22, 1976, Ser. No. 698,590
Int. Cl.[2] D01G *25/00*
U.S. Cl. 19—155 2 Claims

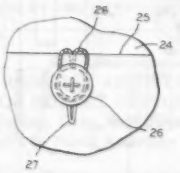


1. A process for forming a staple fiber batt of improved uniformity comprising
   a. depositing the fibers on a moving conveyor to form a batt, the deposition of said fibers being by the falling of said fibers onto said conveyor,
   b. directing a flow of air across the top of said batt in the opposite direction to the movement of said conveyor to skim off the top layer of fibers therefrom, the flow of air thereby determining the level of said batt, and to cause the skimmed off fibers and falling fibers to swirl around across the top of the batt, thereby improving the uniformity of the batt, and
   c. redepositing the skimmed off fibers onto said batt along with the falling fibers.

4,043,006
BUTTON LOCKING DEVICE

Ben Williams, and George H. Miller, both of 3955 N. Murray Ave., Shorewood, Wis. 53211

Filed Mar. 17, 1975, Ser. No. 553,158
Int. Cl.[2] A44B *1/00, 1/18*
U.S. Cl. 24—90 R 10 Claims



1. In the combination of a first fabric with a button permanently fastened thereto and a second fabric with an edge and a button hole adjacent said edge for receiving said button therethrough and to expose said button beyond said second fabric whereby to releasably button the two fabrics together, the improvement for locking the two fabrics together notwithstanding release of the button from the button hole and comprising a flexible link, means permanently securing one end of the flexible link to the first fabric, said flexible link extending between said fabrics from said button and being looped over the edge of the second fabric and said other end of the flexible link encircling exposed button whereby to lock the two fabrics

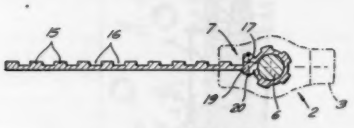
together notwithstanding release of the button from the button hole.

4,043,007

WARP-KNIT SLIDE-FASTENER SUPPORT TAPE AND STRINGER

Helmut Heimberger, Locarno, Switzerland, assignor to OPTI Patent-, Forschungs- und Fabrikations-AG, Glarus, Switzerland

Filed Sept. 30, 1976, Ser. No. 728,133
Claims priority, application Germany, June 15, 1976, 2626661
Int. Cl.[2] A44B *19/00*
U.S. Cl. 24—205.1 C **12 Claims**



1. A support tape for a slide-fastener stringer half, said tape having a pair of longitudinally extending edges and a pair of opposite faces and being warp knit with:

an intermediate warp yarn spaced from said edges and forming a longitudinally extending double wald projecting on both faces of said tape and subdividing same transversely into an attachment strip and an edge strip;

a plurality of first warp yarns in only said attachment strip forming a plurality of longitudinally extending single wales projecting only on one face of said tape;

a plurality of second warp yarns in only said edge strip forming a plurality of longitudinally extending single wales projecting only on the other face of said tape; and

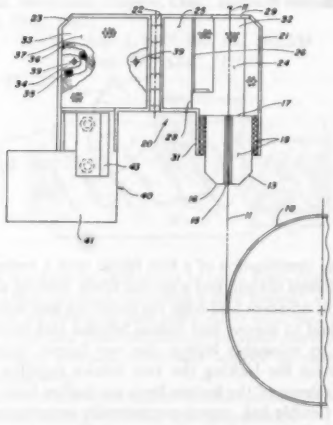
a multiplicity of weft yarns laid into said warp yarns and each extending tranversely over at least one of said wales.

4,043,008

NOISE REDUCTION SYSTEM

William Robert Weiss, Walnut Creek, Calif.; James Judson Cooksey, Colonial Heights, and Phillip Leroy Mullins, Matoaca, both of Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Sept. 8, 1976, Ser. No. 721,262
Int. Cl.[2] D02G *1/16*
U.S. Cl. 28—271 **28 Claims**



1. In combination with a draw point localizing jet wherein advancing yarn is subjected to pressurized, superheated fluid flow, and wherein said draw point localizing jet has at least one yarn passage passing therethrough and defining yarn entrance and exit ends thereof, said yarn passage having an adjacent access slot to facilitate string-up and having at least one fluid conduit per yarn passage for admitting treating fluid thereinto, the improvements comprising:

A. an exhaust muffler, said muffler comprising:

i. a boxlike metal housing, said housing being located at said exit end of said jet, one corner of said housing being hinged so as to provide a door which pivots to an open position for access to said jet during string-up and to a closed position for treatment during operation, said door being located on the side of said housing corresponding to the side of said jet having said access slot therein, said housing comprising two chambers separated by baffle means connected to and extending inward from the exit of said housing towards said exit end of said jet, said baffle means extending to a point just short of said jet exit so that a gap is left between said baffle means and said exit end of said jet, said gap providing a sight line for an operator, the first of said chambers substantially surrounding said exit end of said jet and surrounding said yarn to a point downstream thereof and with an opening for passage of yarn therethrough, the second of said chambers being positioned contiguous to said first chamber;

ii. means for mounting said housing on said jet;

iii. two metal sound absorbing inserts, said inserts comprising a metal frame, a metallic honeycomb sheet, a sintered metal sheet, a perforated metal sheet, and means for sandwiching these elements, the first of said inserts having a U-shape and being mounted opening towards said door in said first chamber, the second of said inserts having a shape corresponding to the interior portion of said door and being mounted thereon, said inserts being adapted for removable connection to said housing and said interior portion of said door so as to line said first chamber without blocking the passage of said yarn therethrough, said metal frame of said inserts being adjacent said housing and said perforated metal sheet being furthest away from said housing, said honeycomb sheet being adjacent said frame, said sintered metal sheet being adjacent said perforated metal sheet, the cells of said honeycomb sheet opening in a plane transverse to that of said yarn passage if extended through said first chamber, the distance between said sintered metal sheet and said metal frame which is occupied by said honeycomb sheet being approximately 0.25 sound wavelength which corresponds to sound frequencies of 8,000 and 16,000 cycles per second, the open area of said perforated metal sheet ranging from 30 to 45%;

iv. means for mounting said inserts to said walls defining said first chamber and to said interior of said door, and

B. access slot silencing means, said access slot silencing means comprising a projection of said housing, a mounting plate, a silencing plate, a pin, and a compression spring, said projection being an extension of said housing door in the direction of said jet entrance, said projection pivoting with said door into an open and a closed position, said projection blocking access to said side of said jet having said access slot therein when in said closed position, said projection having said mounting plate spaced therefrom and attached thereto on the side closer to said jet when in said closed position, said mounting plate having a slot with said pin passing therethrough, said pin being connected on the end located closer to said jet to said silencing plate and being connected at its other end to stopping means which prohibits its passing completely through said slot, said compression spring surrounding the portion of said pin located between said projection and said slot, said silencing plate corresponding in length and being slightly wider than said access slot in said jet; whereby the noise level of said jet is changed from a continuous source to an intermittent source, emitting high level noise only during string-up and alignment, by: (1) the

automatic closure of said access slot by said silencing plate when said jet is operational and said projection is pivoted along with said housing door to within 1.5 inches of said access slot, said closure resulting from the vacuum-like action induced by said treating fluid; and (2) the closure of said access slot simultaneously closing said housing door to close said first chamber of said exhaust muffler thereby reducing noise at the yarn exit, and whereby the noise level of said jet is reduced by up to 16 ± 1.5 Δ dB(A) when said housing door and said projection are in said closed position.

4,043,009

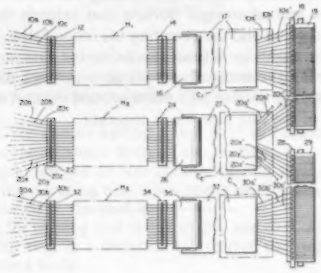
STRAND TREATMENT

Robert K. Stanley, Media, and Ira Schwartz, Philadelphia, both of Pa., assignors to Textured Yarn Co., Inc., Kennett Square, Pa.

Continuation-in-part of Ser. No. 222,135, Jan. 31, 1972, Pat. No. 3,722,042. This application Mar. 14, 1973, Ser. No. 341,320

Int. Cl.² D02G *1/12*

U.S. Cl. 28—221 **13 Claims**



9. Strand-crimping apparatus comprising a plurality of laterally confining stuffing chambers, each having an entrance and an exit, means for feeding strands into the respective entrances, means for withdrawing strands through the respective exits, and multiple strand-traversing means juxtaposed to the feeding means and having multiple spaced positions for guiding spaced strands and for traversing a multiplicity of laterally spaced strands to and fro along the entrances.

4,043,010

PROCESS FOR PRODUCING TEXTURED POLYESTER YARN

Adly Abdel-Moniem Gorrafa, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 497,489, Aug. 14, 1974, Pat. No. 3,973,386. This application June 21, 1976, Ser. No. 697,945

Int. Cl.² D02G *1/16*

U.S. Cl. 28—220 **4 Claims**

1. In a process for producing textured textile yarn fron undrawn continuous filament yarn by first drawing the yarn without texturing the yarn and then air-jet texturing the drawn yarn to form a bulky yarn having crunodal surface loops; the improvement for producing polyester textured yarn having a boil-off shrinkage of less than 3.5 percent without heating the yarn after the yarn is drawn, which comprises continuously feeding to the drawing step a spin-oriented polyester yarn characterized by a break elongation of 70 to 180 percent, a birefringence value of at least 0.025, a crystallinity of less than 30 percent, and a relative viscosity of at least 18, drawing the spin-oriented polyester yarn at 1.3 to 2.0 draw ratio while heating the yarn with a heater at a temperature from 180° to about 210° C and feeding the drawn yarn directly to an air jet at 8 to 35 percent overfeed without additional heating, jet texturing the yarn with the air jet to form crunodal surface loops in the yarn, and packaging the resulting textured yarn at a package speed (P) greater than the take-off speed (T) from the air jet, the value of (T−P)/P (100) being from −1 to −10 percent.

4,043,011

PACKAGING MACHINES

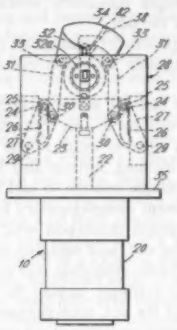
Giorgio Aldo Maria Giraudi, and Nino Imperiale, both of Milan, Italy, assignors to W. R. Grace & Co., Duncan, S.C.

Filed June 23, 1976, Ser. No. 699,023

Claims priority, application United Kingdom, June 30, 1975, 27562/75

Int. Cl.² B65B *51/05*; B23P *11/00*

U.S. Cl. 29—33.5 **12 Claims**



1. A gathering and clipping head for closing bags or the like comprising:

a. opposed gathering members,

b. a common hub rotatably supporting said gathering members,

c. arcuate gathering surfaces formed on said gathering members and arranged to be convex towards said common hub and to overlap in the closed configuration of the gathering members to gather together the neck of a bag to define a tightly gathered neck configuration for clipping,

d. a clip guide slot defined by said gathering members when in their closed positions;

e. a clip-leg deforming die carried by one of said gathering members,

f. means for axially guiding a supply of clips to a location within said hub, and

g. means for driving individual clips radially outwardly from the said location within the hub to be deformed around a bag neck gathered by said gathering members.

4,043,012

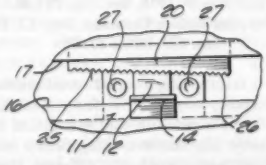
AXIALLY AND RADIALLY ADJUSTABLE CUTTER INSERT FOR ROTARY CUTTING TOOL

Peter C. Rowlson, Eugene, Oreg., and Thomas J. Kuhl, Santa Claus, Ind., assignors to North American Products Corporation, Atlanta, Ga.

Filed Nov. 17, 1975, Ser. No. 632,681

Int. Cl.² B26D *1/28*

U.S. Cl. 29—105 R **8 Claims**



1. A cutter insert for a cutting tool head that has an axis and

is rotatable about the same, said head also having an axially extending radially outwardly opening slot that defines a radially outwardly facing bottom surface and opposite side surfaces which extend parallel to said axis and which are undercut so that the slot is substantially narrower at its mouth than radially inwardly thereof, one of said side surfaces being flat from near said bottom surface to near the mouth of the slot, said cutter insert having a lower base portion receivable in said slot for adjustment therealong and an upper cutter portion which projects radially out of the slot and has a cutting edge that is intended to be spaced a predetermined distance from said axis, said cutter insert being characterized by:

A. the base portion of the cutter insert
   1. having a length dimension which can be oriented lengthwise of the slot,
   2. having a lengthwise extending flat front surface that is flatwise engageable with said one side surface of the slot, and
   3. having a rear inclined surface which is in such lengthwise oblique relation to said front surface that the base portion has a taper in width in one direction along its length, said inclined surface also being in upwardly convergent oblique relation to said front surface;

B. a wedging element complementary to said base portion and having a length dimension which can be oriented lengthwise of the slot, said wedging element
   1. having lengthwise extending rear surface portions that are formed to matingly engage the opposite undercut side surface of the slot, such engagement confining the wedging element against upward movement in the slot, and
   2. having a front inclined surface which is in such lengthwise oblique relation to its said surface portions that the wedging element has a taper in width which is opposite and complementary to said taper of the base portion, so that upon flatwise engagement of said inclined surfaces the distance between said front surface on the base portion and said rear surface portions on the wedging element can be adjusted by lengthwise movement of the wedging element relative to the base portion;

C. cooperating means on the base portion and on the wedging element, rendered operative by flatwise engagement of their said inclined surfaces, for confining the wedging element against lengthwise movement relative to the base portion in any of a plurality of positions of such movement; and

D. means for producing a relievable reaction force between the bottom surface of said slot and the base portion of the cutter insert whereby the latter is urged radially outwardly in the slot and is wedged between the wedging element and said one side surface of the slot to maintain the cutting edge at a distance from said radius that depends upon the lengthwise position of the wedging element relative to the base portion.

4,043,013

TRANSFER ROLLER

Friedrich Zeppernick, Cologne, and Klaus-Peter Dotzel, Bad Homburg, both of Germany, assignors to Firma Felix Bottcher, Cologne, Germany

Filed July 9, 1975, Ser. No. 594,483
Claims priority, application Germany, July 13, 1974, 2433749
Int. Cl.² B21B *31/08*
U.S. Cl. 29—132 **11 Claims**

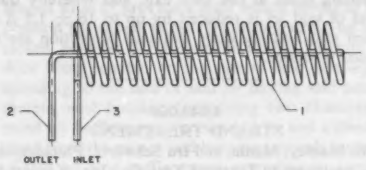
1. A roller for transferring a liquid-based medium, comprising a foundation body non-affinitive for said medium, an intermediate layer firmly bonded to said foundation body, and an uninterrupted very thin elastic coating firmly bonded to said intermediate layer and chemically different therefrom, said coating having an affinity for said medium and non-affinitive for said foundation body.

4,043,014

METHOD OF MAKING A WASTE FLUE HEAT RECOVERY DEVICE

John C. Wilson, 44 Eagle St., Greenville, Pa. 16125

Filed Nov. 11, 1975, Ser. No. 630,796
Int. Cl.² F22D *1/02;* **B21D** *53/02*
U.S. Cl. 29—157.4 **2 Claims**



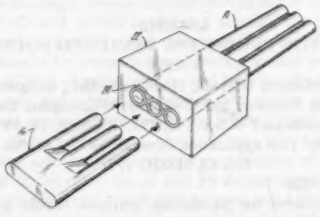
1. A method of manufacturing a heat recovery unit which consists of providing a flue pipe blank, forming a pair of Longitudinally aligned holes which are located at one end of said blank, forming a water heating coil by forming a plurality of coil turns, forming one end of the coil with a straight portion of tubing extending therefrom, forming the other end of the coil with a second straight portion that extends through the middle of the coil and then bending the second straight portion at the right angles to extend parallel to the first straight portion, inserting the ends of said portions through said aligned holes, wrapping the flue pipe blank around the coil and joining the edges of the flue pipe blank together.

4,043,015

METHOD OF FORMING A HEADER ASSEMBLY

Charles E. Hickman, and William G. Hastings, both of Adrian, Mich., assignors to Brazeway, Inc., Adrian, Mich.

Filed Aug. 18, 1976, Ser. No. 715,557
Int. Cl.² B23P *15/26*
U.S. Cl. 29—157.4 **7 Claims**



1. A method of forming a header consisting of a plurality of passage elements transitioning into a common header passage, the method comprising:

forming a blank comprised of a plurality of juxtaposed passage elements with the juxtaposed passage elements integrally interconnected with respective web sections;

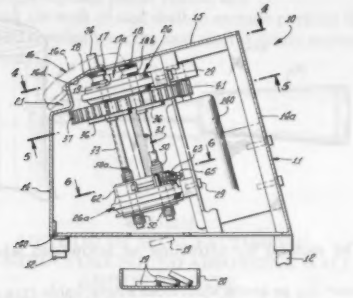
splitting the inside of said blank through thickness of said integral web sections and the wall portions of said passage elements connected by said web sections for a portion of the length of said blank;

forcing said split web portions outwardly away from each other to cold form said header passage without splitting through said portions, whereby said transition is provided without welding of said portions.

4,043,016
APPARATUS TO REMOVE RINGS FROM TELEPHONE HAND SET

Robert D. Elkin, Claremont, Calif., assignor to Collins Machinery Corporation, Monterey Park, Calif.

Filed June 7, 1976, Ser. No. 693,135
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—240 10 Claims



1. In apparatus to release securing rings from a telephone receiver, the rings having thread connection to the receiver earpiece and mouthpiece bodies, the bodies connected by a handle,

a. a receiver carrier having a first well to receive the earpiece or mouthpiece body of the receiver,

b. a chuck exposed to the interior of said well to extend about one securing ring when one of said bodies is removably placed in the well, and

c. means for causing said chuck to grip and to rotate said one securing ring in a direction to remove the ring from its associated body,

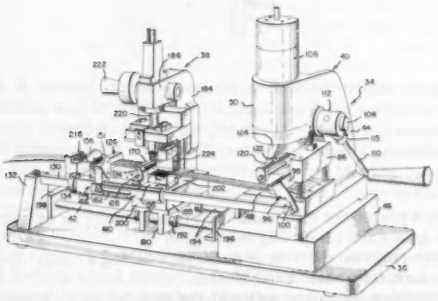
d. structure to block rotation of the receiver in response to said rotation of the securing ring, and

e. carrier means for the chuck forming a through passage in alignment with said one well and opening downwardly to freely pass removed rings for collection below the level of the carrier means.

4,043,017
APPARATUS FOR INSERTING WIRES INTO TERMINALS AND FOR MANUFACTURING ELECTRICAL HARNESSES

Kenneth Foster Folk; Milton Dean Ross, and Walter Clifton Shatto, Jr., all of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 11, 1976, Ser. No. 657,138
Int. Cl.[2] H01R *43/04*
U.S. Cl. 29—749 14 Claims



1. Apparatus for inserting wires into the wire-receiving portions of electrical contact terminals, said terminals being contained in an electrical connector or the like, each terminal having wire-receiving portions which receive a wire upon movement of said wires laterally of its axis and into said wire receiving portions, said wire receiving portions being in side-by-side relationship, said wire receiving portions facing in a common direction, said apparatus comprising:

a wire guiding templet comprising a plate-like member having oppositely facing first and second surfaces, a plurality of wire guiding slots extending across said member from one edge thereof, each of said slots extending entirely through said surface from said first surface thereof to said second surface thereof, each of said slots having a width which is sufficient to permit passages therethrough of one of said wires, each of said slots having a dead end,

connector locating and supporting means proximate to said second surface for locating said connector adjacent to said second surface with each of said wire-receiving portions being proximate to one of said dead ends,

wire insertion means normally spaced from said first surface, said wire insertion means being movable towards said first surface and through said dead ends of slots, said wire insertion means being effective to move wires disposed in said slots through said slots, beyond said second surface and into said wire-receiving portions of said terminals and,

wire pressing means, said wire pressing means being moveable across said one surface from a location adjacent to said one edge thereof to a location which is proximate to, but spaced from, said dead ends of said slots, said wire pressing means being effective during movement across said surface to move wires positioned thereon progressively into said slots until end portions of said wires are adjacent to said dead ends of said slots and in alignment with wire receiving portions of terminals in a connector located on said connector locating and supporting means whereby,

upon locating said connector is said connector locating and supporting means, locating portions of said wires proximate to said first surface and proximate to said one edge of said plate like member, and upon locating each of said wires in one of said slots, and upon applying a pressing force against said wires by said pressing means and moving said pressing means across said surface from said one edge, said wires are progressively moved into said slots until portions of said wires are adjacent to said dead ends and are in alignment with said wire receiving portions of said terminals, and upon movement of said wire inserting means towards said first surface and through said slots, said wires are inserted into said wire-receiving portions of said terminals.

4,043,018
METHOD AND TOOL FOR REMOVING TUBES FROM MULTI-TUBE FINNED HEAT EXCHANGE COIL

Edward C. Neff, Norman, Okla., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 18, 1975, Ser. No. 642,094
Int. Cl.[2] B23P *19/02*
U.S. Cl. 29—427 6 Claims

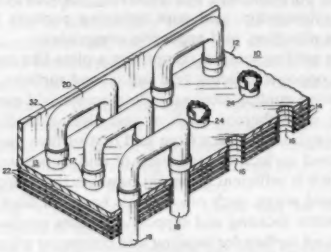
1. The method of removing a tube from a multi-tube finned heat exchanger coil of the type in which the tubes are expanded into the fins comprising cutting a helix in the tube wall for the length of the tube and then pulling the tube out by collapsing the helix formed in the tube wall.

4. A tool for removing an expanded tube of given length, internal diameter, and external diameter from a multitube finned coil heat exchanger comprising:

a cutting end portion and a shank,

said cutting end portion having a succession of cutting teeth arranged in a helical array in one rotative direction, the tips of the cutting teeth successively along the length of the cutting end portion generally progressing radially outwardly from about the internal diameter of the tube to about the external diameter of the tube, the cutting end

portion being adapted to cut a helix into the wall of the tube upon being rotated in the tube, and



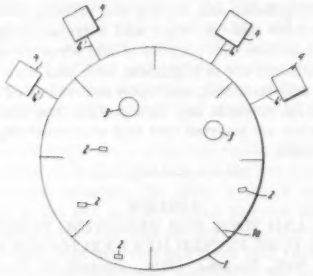
a series of flutes extending along the cutting end portion to receive the chips generated by cutting the helix.

4,043,019

METHOD AND ARRANGEMENT FOR SEPARATING THE MATERIAL FORMING ONE PART OF AN ARTICLE FROM THAT FORMING ANOTHER PART THEREOF, PARTICULARLY FOR USE WITH METAL-SYNTHETIC RESIN COMPOSITES

Helmut Schröder, Bonn-Bad Godesberg, Germany, assignor to Vereinigte Aluminium-Werke Aktiengesellschaft, Germany

Continuation of Ser. No. 506,733, Sept. 17, 1974, abandoned. This application Mar. 11, 1976, Ser. No. 666,004
Claims priority, application Germany, Sept. 19, 1973, 2347108
Int. Cl.[2] B02C *19/12*
U.S. Cl. 29—427 **7 Claims**



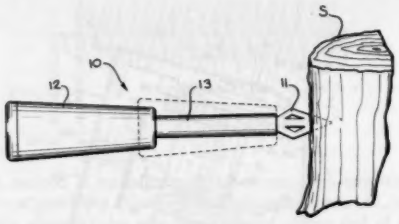
1. A method of preparing a metallo-plastic bottle cap for recycling by separating the plastic component which is confined in the recessed interior of the metallic cap component, comprising the steps of confining a plurality of said caps in a perforated drum having an inner circumferential surface provided with projections, together with a plurality of impacting members; cooling said caps so as to cause said plastic component to become substantially more brittle than said metallic component; and rotating said drum so that said projections entrain and agitate said caps and said impacting members to cause the latter to impact said caps and to thereby break up the brittle plastic components without breaking up the metallic components, so that the plastic components can fall out of the recessed interior of said metallic components and be removed, leaving the metallic components free of the plastic components and ready to be recycled without contamination by the plastic components.

4,043,020

ARROWHEAD EXTRACTOR

Anthony J. Hoggard, Merrill, Mich., assignor to Tomar Corporation, Indian River, Mich.

Filed July 16, 1976, Ser. No. 705,764
Int. Cl.[2] B23P *19/02*
U.S. Cl. 29—427 **5 Claims**



1. The method for extracting an arrowhead which comprises:

a. removing an arrow shaft from a detachable type of arrowhead having sharp edges for hunting embedded in an object such that the head is exposed;

b. attaching a slide percussion tool with a linearly slidable housing mounted on a shaft with a percussion stop to the arrowhead;

c. repeatedly sliding the housing in a direction which approximates the direction of entry of the arrowhead into the object in order to remove the arrowhead from the object by hammering the housing against the stop; and

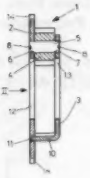
d. inserting the arrowhead into the object where it was embedded in order to detach the arrowhead from the tool.

4,043,021

PROCESS FOR MAKING SHEET-METAL PLANET CARRIER

Rudolf Mosbacher, Mariabrunn, and Hans Ruppik, Friedrichshafen, both of Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Germany

Filed Jan. 28, 1976, Ser. No. 653,001
Claims priority, application Germany, Jan. 29, 1975, 2503518
Int. Cl.[2] B23P *11/00*
U.S. Cl. 29—437 **1 Claim**



1. A process for manufacturing a planet carrier for an epicyclic gear train, comprising the steps of :

stamping two sheet-metal disks, each having a central aperture, from sheet-metal blanks;

punching , simultaneously with the stamping step, a plurality of generally circular mounting holes in each of said disks around the central aperture thereof;

accompanying the punching of said holes by a partial pene-

tration of said blanks with formation of at least one peripheral notch adjacent each mounting hole;

assembling said disks parallel to each other into a unitary body with their central apertures coaxially disposed and with their mounting holes aligned;

interposing a planet pinion between said disks in line with each pair of aligned mounting holes;

passing a shaft through each pair of aligned mounting holes and the interposed planet pinion; and

deforming the ends of said shaft to extrude portions thereof into said notches whereby said shaft is firmly anchored to said body.

4,043,022

METHOD OF MANUFACTURING DOUBLE-STRUCTURE SOUND ABSORBING WALL FOR MOTOR VEHICLE

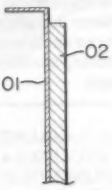
Keiichi Kisuna; Satoru Toyama, and Hiroshi Kimura, all of Nagoya, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1976, Ser. No. 736,482

Claims priority, application Japan, Nov. 17, 1975, 50-137247; Jan. 9, 1976, 51-104523; Jan. 9, 1976, 51-104524; Feb. 9, 1976, 51-105642

Int. Cl.[2] B23P *3/00, 19/04*

U.S. Cl. 29—460 **12 Claims**



1. A method of manufacturing a double-structure sound absorbing wall for a vehicle, said sound absorbing wall having a cavity defined by joining peripheral edges of first and second plate members, said method comprising the steps of providing said first and second plate members with gas bleeding holes and recesses depressed toward the inside of said cavity to abut the members to each other, providing a heat-foamable sound insulating member received in said cavity with relief holes for spot-welding corresponding to said recesses, holding said heat-foaming sound insulating member by said recesses upon abutting of said plate members, abutting said peripheral edges to each other, spot-welding said recesses to each other to close said cavity, and foaming said heat-foamable sound insulating member by heating to fill said cavity therewith.

4,043,023

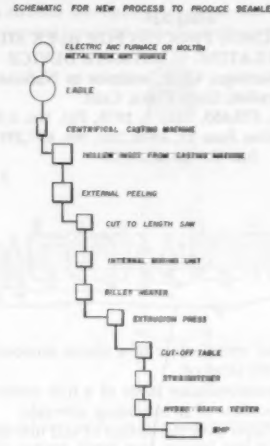
METHOD FOR MAKING SEAMLESS PIPE

Daniel L. Lombard, 121 W. Boardman St., P. O. Box 177, Youngstown, Ohio 44501

Continuation-in-part of Ser. No. 577,029, May 13, 1975, abandoned. This application Jan. 5, 1977, Ser. No. 757,015

Int. Cl.[2] B22D *11/126, 11/128*

U.S. Cl. 29—527.6 **2 Claims**



1. The method of making seamless pipe from molten metal, comprising centrifugally casting said molten metal to form a hollow ingot, externally peeling said hollow ingot and internally boring said ingot and cutting it to the desired length, thereafter heating the billet and subjecting the billet to a hot extrusion press for hot extruding the pipe for a period of seconds to enable high magnitude reduction ratios of about 5 to 1 to about 60 to 1, thereby considerably reducing grain size.

4,043,024

METHOD OF MANUFACTURING A SEMICONDUCTOR STORAGE DEVICE

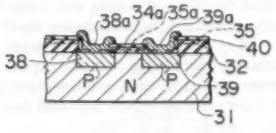
Seiichi Iwamatsu, Tokyo, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 21, 1975, Ser. No. 634,187

Claims priority, application Japan, Nov. 22, 1974, 49-133654

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—571 **2 Claims**



1. A method of manufacturing a semiconductor storage device comprising the steps of

a. forming an oxide film on a surface of a semiconductor substrate of a first conductivity type;

b. selectively removing said oxide film and thus exposing part of said surface of said semiconductor substrate;

c. forming a gate oxide film thinner than the first-mentioned oxide film on the exposed part of said surface of said semiconductor substrate;

d. implanting ions of an electrically conductive element into at least said gate oxide film, thus forming a floating gate;

e. selectively removing part of the resultant gate oxide film thus forming therein window portions for forming source and drain regions spaced apart from each other;

f. doping said semiconductor substrate with an impurity of a second conductivity type opposite said first conductivity

type through said window portions for forming source and drain regions, thus forming said source and drain regions;

g. forming a chemical vapor deposition oxide film so as to cover said gate oxide film; and

h. leading out source and drain electrodes from said source and drain regions, respectively.

4,043,025

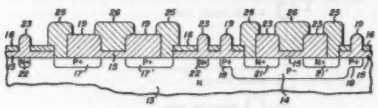
SELF-ALIGNED CMOS PROCESS FOR BULK SILICON AND INSULATING SUBSTRATE DEVICE

Gregorio Spadea, Saratoga, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 575,655, May 8, 1975, Pat. No. 3,983,620. This application June 17, 1976, Ser. No. 697,291

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—571 **3 Claims**



1. The method for manufacture of a silicon semiconductor device comprising the steps of:

forming a first semiconductor layer of a first conductivity type over the surface of an insulating substrate,

forming an oxide layer over the surface of said first semiconductor layer,

forming a silicon nitride layer over the surface of said oxide layer,

masking and etching said silicon nitride and said oxide layer to form openings therein at first regions of said first semiconductor layer,

diffusing a dopant through said latter openings to form source and drain regions of said conductivity type in said first regions of said first semiconductor layer with a gate region extending between the source and drain regions, a thick oxide layer being formed over said source and drain regions during said diffusion,

masking said gate region and a portion of the oxide layer at the source and drain regions adjacent said gate region,

forming a thin layer channel region of a second conductivity type in a second region of said first semiconductor layer removed from said first region,

etching both the thick oxide layer and the underlying first semiconductor layer in the outer portions of said first region to isolate the diffused source and drain regions in said first region of said first semiconductor layer from said second region of said first semiconductor layer,

forming an insulating oxide layer over the exposed surfaces of said first semiconductor layer, and simultaneously driving said thin layer channel region into said first semiconductor layer,

masking and etching openings through said silicon nitride layer and said underlying silicon oxide layer to define source and drain regions separated by a gate region in said second region of said first semiconductor layer,

diffusing a dopant through said latter openings to form source and drain regions in said second region of said first semiconductor layer,

masking and etching openings in the oxide layer over said source and drain regions in said first and second regions of said first semiconductor layer to form connect openings thereto,

etching away the silicon nitride layer remaining over the gate regions,

depositing a metallization layer over the device,

masking said metal layer to define the metal connect and interconnect openings to the various source, drain, and gate regions, and

etching the metal to form the gate electrodes and the source and drain connects.

4,043,026

METHOD OF MAKING CONNECTOR FOR LIGHT-CONDUCTIVE FIBERS

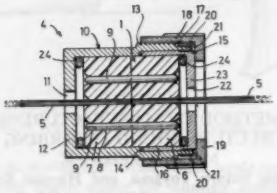
Wolfgang Weidhaas, Cologne, and Hans-Joachim Trappenberg, Langenfeld, both of Germany, assignors to Felten & Guilleaume Carlswerk AG, Cologne, Germany

Filed Apr. 30, 1976, Ser. No. 682,172

Claims priority, application Germany, June 25, 1975, 2528270

Int. Cl.[2] G02B *5/14, 7/00*

U.S. Cl. 29—592 **13 Claims**



1. A method of coaxially connecting light-conductive fibers, comprising the steps of forming a connecting body with at least one receiving passage and at least two aligning passages axially parallel to said receiving passage; subdividing said connecting body along a plane substantially normal to the axes of said passages into two connecting members which have contact surfaces at said plane; introducing the end portions of the light-conductive fibers into the receiving passages of the connecting members so that the end faces of the fibers are flush with said contact surfaces; and alignedly connecting said connecting members with one another so that said contact surfaces abut one another, including accommodating aligning elements in said aligning passages.

4,043,027

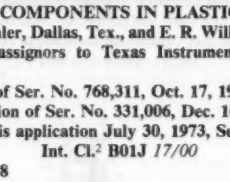
PROCESS FOR ENCAPSULATING ELECTRONIC COMPONENTS IN PLASTIC

Robert O. Birchler, Dallas, Tex., and E. R. Williams, Jr., Scottsdale, Ariz., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 768,311, Oct. 17, 1968, abandoned, which is a division of Ser. No. 331,006, Dec. 16, 1963, Pat. No. 3,439,238. This application July 30, 1973, Ser. No. 384,768

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—588 **17 Claims**



1. A process for encapsulating a miniaturized semiconductor device having a multiplicity of electrical terminals comprising the steps of:

electrically connecting each of the electrical terminals of the device to an intermediate point of a conductor and mechanically attaching each component of the device to at least one of the conductors for support,

disposing the device and the adjacent intermediate portions

of the conductors in a mold cavity with the opposite ends of each of the conductors extending from generally opposite sides of the mold cavity, and

holding the opposite ends of the conductors extending from the mold cavity while injecting a fluid insulating material into the mold cavity which will subsequently solidify, the fluid insulating material being injected into a portion of the mold cavity remote from the device and the means electrically connecting the terminals of the device to the conductors,

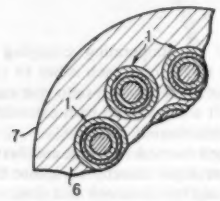
whereby the fluid will not directly engage the device and electrical connection means at a high velocity and the conductors will be secured against appreciable displacement by the fluid which would be likely to break or displace a connection means in such a manner to cause a failure of the device.

4,043,028

METHOD OF FABRICATING COMPOSITE SUPERCONDUCTORS

Yoshiyasu Koike, Chigasakishi; Hachio Shiraki, Komukai-Nishimachi; Eigen Suzuki, and Makoto Yoshida, both of Yokohamashi, all of Japan, assignors to Showa Electric Wire and Cable Company, Japan

Filed May 10, 1976, Ser. No. 685,903
Int. Cl.[2] H01V *11/00*
U.S. Cl. 29—599 **10 Claims**



1. A method of fabricating composite superconductors comprising the steps of:

forming a stock product comprising a tin based alloy core surrounded by a copper jacket which is cladded with a niobium tube;

embedding at least one of said stock products in a good thermal and electrical matrix in order to make a composite structure;

coreducing said composite structure until a desired size is obtained; and,

submitting said coreduced composite structure to a heat treatment.

4,043,029

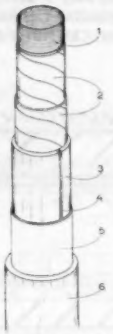
WAVEGUIDE AND PROCESS FOR MAKING THE SAME

Jacques Allanic, Sceaux, and Guerchon Georges Fuchs, Paris, both of France, assignors to Societe Anonyme de Telecommunications and Etat Francais represente par le Secretaire des Postes et Telecommunications (Centre National D'Etudes des Telecommunications), both of, France

Filed Dec. 24, 1975, Ser. No. 644,146
Claims priority, application France, Jan. 17, 1975, 75.01430
Int. Cl.[2] H01P *11/00, 3/12*
U.S. Cl. 29—600 **5 Claims**

1. A method for the manufacture of a circular waveguide having an inner wall formed by a helically wound insulated metallic wire covered with a wound and wrapped barrier layer which barrier layer is in turn covered by a cylindrical metallic screen of sufficient longitudinal and transverse rigidity as to render the waveguide self supportive, which comprises winding said metallic wire into a helix and covering said helix with said wound and wrapped barrier layer, separately forming a metal band into a tubular cross section and joining the contiguous edges of the band by high frequency welding, the internal diameter of the shaped and welded tube being a few millimeters greater than the external diameter of the wound and wrapped helix, positioning said tube around said wound and wrapped helix and shaping said tube into said cylindrical metallic screen so that the nominal internal diameter of the shaped screen is only a few hundredths of a millimeter greater than the nominal outside diameter of said wound and wrapped helix.

2. In a circular waveguide having an inner wall formed by a helically wound insulated metallic wire covered with a wound



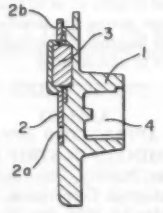
and wrapped barrier layer, the improvement which comprises a metallic screen about said wound and wrapped helix, said screen being of sufficient longitudinal and transverse rigidity to render the waveguide self supportive and consisting of a metal band formed into a tube with a high frequency weld joining the contiguous edges of the band, which welded tube is shaped about said wound and wrapped helix so that the nominal internal diameter of said screen is only a few hundredths of a millimeter greater than the nominal outside diameter of said wound and wrapped helix.

4,043,030

PROCESS FOR PREPARING DISTRIBUTION ROTOR

Masayoshi Onishi, Himeji, and Yoshinobu Aiyama, Johana, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed July 30, 1976, Ser. No. 710,329
Int. Cl.[2] H01H *11/00*
U.S. Cl. 29—622 **1 Claim**



1. A process for preparing a distribution rotor comprising:

forming an electrode having an outer electrode part and a central electrode part joined together by a connecting part,

joining through the application of heat a first end of a resistor to the central electrode part and joining through the application of heat a second end of the resistor to the outer electrode part, the connecting part absorbing the thermal strain and non-uniform stress caused by the application of heat,

severing and removing the connecting part, and

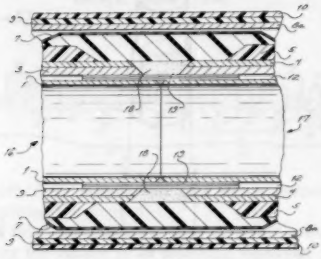
molding the assembly of the electrode and the resistor with a resin so as to form a one piece resin block.

4,043,031

METHOD OF MANUFACTURING INTERNALLY COOLED HIGH-ENERGY CABLE

Jürgen Friedrich; Engelbert Friesenhagen, and Werner Rasquin, all of Cologne, Germany, assignors to Felten & Guilleaume Carlswerk AG, Cologne, Germany

Division of Ser. No. 545,036, Jan. 29, 1975, Pat. No. 3,989,884. This application July 1, 1975, Ser. No. 592,253
Claims priority, application Germany, Aug. 2, 1974, 2372790
Int. Cl.[2] H01R *43/02*
U.S. Cl. 29—628 **7 Claims**



1. A method of manufacturing a high-voltage high-energy cable of a plurality of cable lengths, comprising the steps of providing an inner tubular member of metallic corrosion-resistant material for each of the cable lengths; providing an elongated blank member of metallic electrically conductive material for each of the cable lengths; forming one of said members with at least one longitudinally extending groove in the region of one surface thereof; mechanically shrinking said blank member around said tubular member so that said one surface comes into contact with the other member and said blank member forms a tubular element around said tubular member, said groove being located at the interface between said tubular element and said tubular member; winding a plurality of elongated trapezoid elements around said tubular element to obtain a cable length core; insulating and sheathing said core to obtain a cable length; juxtaposing end portions of respective cable lengths with one another so that said grooves of said cable lengths are aligned with one another; inserting end portions of a tube of highly temperature-resistant material into said grooves of said cable lengths so as to establish communication between said grooves across the interface between said end portions of said cable lengths; and connecting said end portions of said cable lengths to one another.

4,043,032

TERMINAL APPLICATOR APPARATUS FOR TERMINALS IN STRIP FORM

Paul Joseph Spangler, Novelty, Ohio, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 12, 1976, Ser. No. 685,794
Int. Cl.[2] H01R *43/04*; B21F *15/00*
U.S. Cl. 29—628 **11 Claims**

1. Apparatus for crimping electrical terminal devices onto wires, said terminal devices being secured to a belt in side-by-side relationship with their axes extending laterally of said belt, said apparatus comprising:

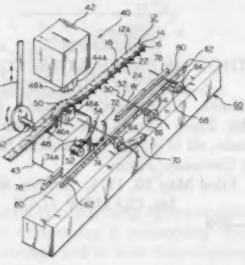
a pair of cooperable crimping dies, said dies being movable relatively towards and away from each other to crimp a terminal device located therebetween onto one end of a wire;

belt feeding means fixedly mounted on one side of said dies, said belt feeding means being effective to guide and index said belt along a path extending past said dies on said one side thereof thereby to locate the leading uncrimped terminal on said belt between said dies;

first means on the other side of said dies for holding said wire substantially fixed at a point thereof which is spaced apart from said one end of said wire; and

means located between said first means and said dies for moving said wire adjacent said one end relatively away from said dies and prior to completion of a subsequent indexing of said belt, to break a crimped terminal away from said belt.

4. A method for crimping terminal devices onto wire, said terminal devices being secured to a belt in side-by-side relationship with their axes extending laterally of the belt, said method comprising the steps of:



moving a pair of cooperating crimping dies relatively towards and away from each other to crimp a terminal device located therebetween onto one end of a wire;

guiding said belt along a fixed path extending past said dies and on one side thereof;

indexing said belt toward said dies and between successive crimping operations thereby to locate the next leading terminal on said belt between said dies;

holding said wire at a fixed point thereof which is spaced-apart from said one end; and

moving at least the portion of said wire which is adjacent said one end relative to said fixed point, thereby to break the crimped terminal away from said belt.

4,043,033

MACHINE FOR INSERTING ELECTRICAL CONTACTS INTO ELECTRICAL INTERCONNECTION BOARDS

Herbert G. Yeo, Lincoln, R.I., assignor to Augat Inc., Attleboro, Mass.

Filed Apr. 22, 1976, Ser. No. 679,174
Int. Cl.[2] H05K *3/30*
U.S. Cl. 29—739 **1 Claim**

1. Safety means in combination with a machine for inserting elongated electrical contacts into holes in electrical interconnection boards, said machine comprising; means for holding a multiplicity of said contacts, means for feeding said contacts in tandem fashion from said holding means, means extending from said feeding means for arranging a plurality of said contacts in at least one closely adjacent row, escapement means mounted to said arranging means, insertion means having an exhaust nozzle, said insertion means normally operating in a vertical orientation, means for flexibly connecting said insertion means to said escapement means, said escapement means removing said contacts individually from said arranging means and feeding them to said insertion means through said flexible connecting means, and means for controlling the operation of said escapement means to eject said contacts individually from said exhaust nozzle at a predetermined rate, wherein said safety means comprises:

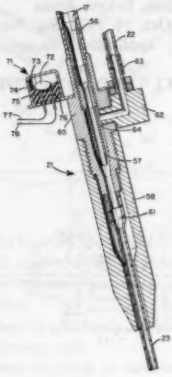
a safety switch mounted to said insertion means and operatively connected to said controlling means to stop operation of said escapement means when said insertion means

is tilted at a predetermined angle with respect to the vertical, said switch comprising:

a housing having a top and walls extending therefrom forming a cup shaped enclosure;

a receptacle having a concave configuration within said housing, said concave surface of said receptacle extending outwardly to intersect the interior walls of said housing thereby forming a closed cavity between the interior surfaces of said top and sides of said housing and the concave surface of said receptacle;

a pair of contacts terminating substantially at the concave surface of said receptacle and extending externally of said switch;



wires for connecting said contacts to said controlling means; and

a pool of mercury residing at all times within said cavity and normally in said receptacle, said mercury normally bridging and electrically interconnecting both of said contacts when said insertion tool is in an upright orientation, said mercury moving out of engagement with at least one of said contacts when said insertion tool is tilted to between 30° and 45° with respect to the vertical, thereby opening the circuit to said controlling means and stopping the operation of said escapement means, said mercury returning freely to its operative position bridging said contacts when said insertion tool is returned to normal position within 30° to 45° with respect to the vertical.

4,043,034

METHOD AND APPARATUS FOR CONNECTING CONDUCTORS TO TERMINALS IN CONNECTORS

Matthew Michael Sucheski, Harrisburg, and Earl William Wagner, Annville, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 26, 1976, Ser. No. 679,961

Int. Cl.[2] H01R *43/00*

U.S. Cl. 29—749 **14 Claims**

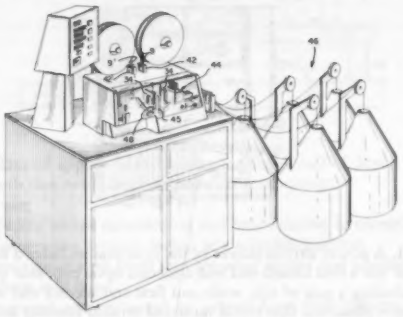
1. Apparatus for manufacturing a multi-circuit electrical connecting means of the type comprising at least one multi-contact electrical connector having a plurality of contact terminals therein and wires connected to, and extending from, said terminals, said terminals having wire-receiving portions which are arranged in side-by-side parallel relationship in a row, said wires being received in said wire-receiving portions, said apparatus comprising:

a wire insertion zone,

a wire feed means for feeding a plurality of wires from endless sources along a predetermined wire feed path which extends through, and beyond, said zone, said wire feed means comprising feed roll means and separate pressure roll means for each of said wires, feed roll means, feed roll motor means for rotating said feed roll means, said pressure roll means being in side-by-side spaced apart relationship and being normally spaced from said feed roll means, said pressure roll means and said feed roll means being on parallel spaced apart axes,

connector holding and locating means for locating a connector on one side of said wire feed path with said wire receiving portions of said terminals in alignment with wires which have been fed along said wire feed path,

wire inserter means in said insertion zone on the side of said wire feed path which is opposite to the side of said connector holding and locating means, said wire inserter means being normally spaced from said path and having means thereon for moving wires laterally of their axes and into said wire-receiving portions of terminals in a connector in said holding and locating means,



wire feed control means comprising means for moving said pressure rolls relatively towards said feed roll means selectively and in unison, for starting and stopping said feed roll means, and for operating said feed roll means for a preselected time interval, and

inserter actuating means for moving said inserter and a connector in said connector holding and locating means towards said path

whereby, a predetermined length of each of said wires can be fed from said sources through said insertion zone by said wire feed means and said wires can thereafter be inserted, by said wire inserter means, into said wire-receiving portions of terminals in a connector in said holding and locating means.

4,043,035

SHAVING UNIT DISPENSER

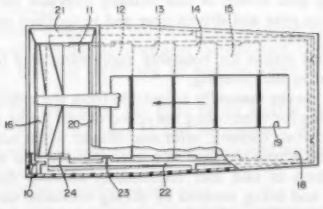
Harry Pentney, Reading, England, assignor to The Gillette Company, Boston, Mass.

Filed May 3, 1976, Ser. No. 682,324

Claims priority, application United Kingdom, May 29, 1975, 23499/75

Int. Cl.[2] B26B *21/24*; A45D *27/24*

U.S. Cl. 30—40.2 **6 Claims**



1. A container for storing and dispensing a replaceable shaving unit, comprising means for locating a razor handle in a loading position in which said shaving unit can be transferred from a storage position in the container into a position of operative engagement with the handle, and latch means which

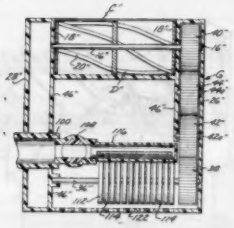
prevents movement of the shaving unit from its storage position, the latch means being operated to release the shaving unit by location of the razor handle in the loading position.

4,043,036

POWER DRIVEN SHAVER

Richard N. Stevens, Sr., Placentia; Clarence R. Possell, San Diego, and Robert J. Winkler, Santa Ana, all of Calif., assignors to Alpha Nova Development Corporation, Santa Ana, Calif.

Filed Jan. 27, 1977, Ser. No. 763,001
Int. Cl.[2] B26B *19/16*
U.S. Cl. 30—43.6 **2 Claims**



1. A power driven shaver of the type that includes a housing that has a first closed end and a second open end, said housing including a pair of side walls and first and second end walls; a semi-cylindrical thin shield mounted on said housing and closing said second end, said shield having a plurality of longitudinally spaced, circumferentially extending slots therein; a prime mover mounted in said housing adjacent said first end; said prime mover being a plurality of turbine discs that rotate in said housing on a common longitudinal axis, said discs having a plurality of circumferentially spaced longitudinally aligned openings therein; a driving gear in said housing that is rotated by said prime mover; said power driven shaver being characterized by including:

a. a cutting reel assembly that comprises:
   1. a first shaft that has first and second end portions;
   2. a plurality of circular plates rigidly secured to said first shaft and occupying longitudinally spaced positions between said first and second end portions;
   3. a plurality of elongate resilient cutting blades of helical shape that are removably supported in longitudinally extending, circumferentially spaced relationship on said plates in a plurality of slots formed in said plate; and
   4. a driven gear mounted on said first end portion of said first shaft,

b. first means in said housing adjacent said first and second walls for rotatably supporting said first and second end portions of said shaft, with said cutting blades when said reel is rotated sequentially moving circumferentially relative to said shield and adjacently disposed to the interior surface thereof;

c. idling gear means in said housing disposed between said driving gear and driven gear and in toothed engagement therewith;

d. second means for rotatably supporting said idling gear means in said housing;

e. third means manually adjustable from the exterior of said housing for controlling the speed of said prime mover and reel driven thereby, with said shaver when said shield is moved across the face of a user shaving said user due to whiskers of said user sequentially moving through said slots and being severed by slicing rotatable contact with said blades as said reel rotates;

f. a header disposed in said housing adjacent said turbine discs, said header having a plurality of apertures therein through which jets of water discharge into spaces between said discs, said jets of water losing velocity due to the frictional drag on said discs as the latter are rotated, with the pressure on said water increasing to force said water inwardly to flow through said openings, and said water after discharging from said openings flowing through openings in said housing;

g. a flexible hose connected to said header; and,

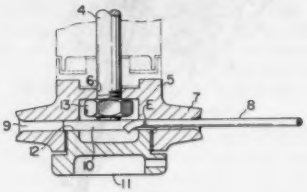
h. connection means for connecting said hose to a source of pressurized water.

4,043,037

CORD-TYPE MOWING TOOL

Tatsuo Okamoto, Yokosuka; Masat Nogawa, Yokohama, and Nobuyoshi Okabe, Musashino, all of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Oct. 14, 1976, Ser. No. 732,588
Claims priority, application Japan, Oct. 15, 1975, 50-139406[U]
Int. Cl.[2] A01D *55/18*; B27B *27/00*
U.S. Cl. 30—276 **1 Claim**



1. A cord-type mowing tool comprising:

a cutter body formed in the center of its top wall with an upper opening for connecting the mowing tool to a mowing machine, said cutter body being further formed with a flange for forming therein at least one cord inserting bore extending radially of the cutter body and with an internally threaded central bottom opening disposed below said upper opening to provide an inwardly extending annular ledge on an inner wall surface of the cutter body;

a clamping member having an externally threaded portion and an upper end portion; and

at least one cord inserted in said at least one cord inserting bore in a manner such that an end portion thereof is forced by the upper end portion of the clamping member tightly against the inwardly extending annular ledge of the cutter body when the clamping member is threadably fitted in the threaded central bottom opening, whereby the cord can be held in place in the cutter body to serve as a blade.

4,043,038

SYMMETRICAL WALLPAPER TRIMMER

Leroy K. Selfridge, Vista, Calif., assignor to Eugene W. Selfridge, Portland, Oreg.

Continuation-in-part of Ser. No. 704,500, July 12, 1976. This application Jan. 3, 1977, Ser. No. 756,287
Int. Cl.[2] B26B *29/00*
U.S. Cl. 30—293 **9 Claims**

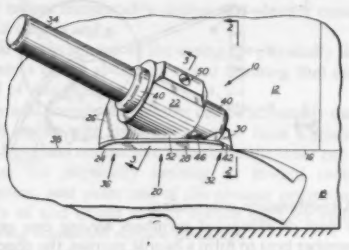
1. A wallpaper trimming device for cutting wallpaper at a joint between a wall being papered and an adjacent structural member, said trimming device comprising:

a. a body member for positioning said trimming device against said adjacent structural member and guiding said wallpaper gradually into said joint, said body member having a portion thereof in the shape of a portion of the lateral surface of the cone, an apex end and a base end;

b. a first substantially flat flange attached along one edge thereof to said body member such that the plane of said flange is substantially tangent to said conically-shaped portion of said body member, said flange extending outwardly therefrom for positioning said trimming device

against said wall being papered and pressing said wallpaper against said wall;

c. a second substantially flat flange attached along one edge thereof to said body member such that the plane of said flange is substantially tangent to said conically-shaped portion of said body member, said flange extending outwardly therefrom for positioning said trimming device against said wall being papered and pressing said wallpaper against said wall, the respective planes of said first and said second flanges converging upon one another toward



an imaginary line located beyond said edges of attachment of said flanges to said body member in directions opposite the directions of outward extension of said flanges from said body member;

d. a handle attached to said body member for manipulating said trimming device; and

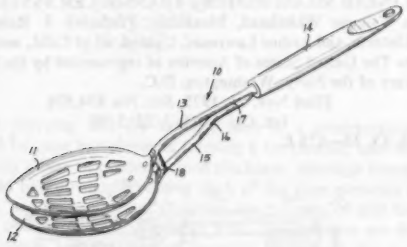
e. a cutting member attached to said body member at said apex end for cutting said wallpaper at said joint, said cutting member being positioned by said body member and one of said flanges selected to position said trimming device against said wall being papered.

4,043,039

STIRRING DEVICE WITH DUAL HEAD

Britton A. Goetze, Jr., 1785 Black Oaks Lane, Wayzata, Minn. 55391

Filed Feb. 2, 1976, Ser. No. 654,607
Int. Cl.[2] A47J *43/28*
U.S. Cl. 30—325 **9 Claims**



1. A stirring utensil, in combination:

first and second spoon bowl elements; said bowl elements being unconnected to each other;

a handle;

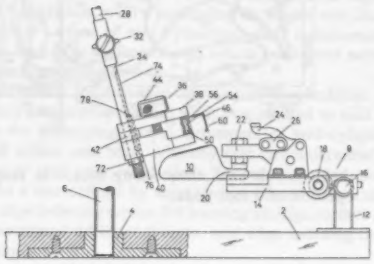
and means fixedly mounting said bowl elements on said handle in mutually spaced relation so that all like points on said bowl elements are everywhere substantially equidistant, and said mutually spaced bowl elements are immovable with respect to each other.

4,043,040

DENTAL DOWEL PIN SETTING APPARATUS

Alfonzo Diez de Aux, 74 James Gray Drive, Willowdale, Ontario, Canada

Filed Apr. 14, 1975, Ser. No. 568,112
Int. Cl.[2] A61C *13/00*
U.S. Cl. 32—11 **5 Claims**



1. Dental apparatus for setting the shank end of dowel pins in tooth dies made in an impression comprising:

a base;

securing means mounted on said base adapted to clamp said impression upward facing in a selected position;

a column spaced from said securing means and upstanding from said base;

a support arm mounted to extend from said column and directionally adjustable relative to said column;

a holder mounted on said support arm, and adjustable as to spacial orientation thereby, said holder having an upper plate, a lower plate, a rod extending between said plates substantially normal thereto, and means for tightening said plates towards each other;

a plurality of prongs mounted on said holder each prong having a first portion extending outwardly and a second portion extending downwardly from said first portion substantially normal thereto, said first portion of said prong having an elongated slot receiving said rod therethrough;

said upper plate and lower plate of said holder being positioned apart to form an adjustable space therebetween and being adapted to clamp said prongs therebetween upon operation of said tightening means;

means adapted to suspend a dowel pin downwardly extending from said second portion of said prong.

4,043,041

DENTAL TREATMENT CONTROL UNIT

John Robert Hornick, 24961 Whisler Drive, El Toro, Calif. 92630

Filed May 6, 1976, Ser. No. 683,936
Int. Cl.[2] A61C *19/02*
U.S. Cl. 32—22 **11 Claims**

1. A dental treatment control unit for controlling the flow of air and water to dental treatment instruments, comprising,

flexible lines for supplying air and/or water to said instruments,

means for regulating the flow of air and/or water in said lines to selected ones of said instruments, and

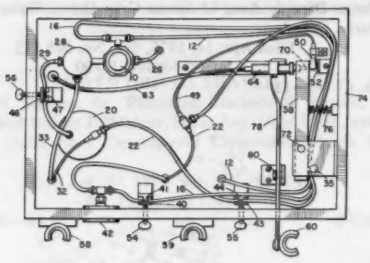
foot-controlled means for controlling said regulating means characterized by

said regulating means comprising

means that are normally biased for squeezing said flexible lines to prevent the flow of air and/or water therethrough, and means for unsqueezing those of said lines that are connected to a selected dental treatment instrument; and

said foot-controlled means comprising

a closed hydraulic system including a hydraulic actuator



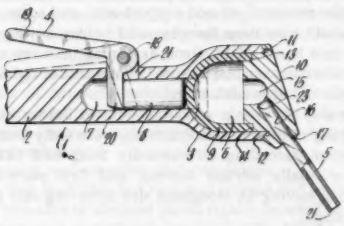
that controls said unsqueezing means in response to opertion of a foot pedal.

4,043,042

APPLICATOR FOR TOOTH SEALANT

Alan J. Perfect, Allentown, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Oct. 7, 1975, Ser. No. 620,435
Int. Cl.[2] A61C *17/00*
U.S. Cl. 32—40 R **7 Claims**



1. An applicator for dispensing a small amount of a polymerizable fluid on tooth surfaces comprising:

an elongated member,

a first bore formed in the forward end of said elongated member,

a first chamber formed in the forward end of said elongated member and in direct communication with said first bore,

a resilient diaphragm positioned in said first chamber,

movable means in said first bore positioned with respect to said resilient diaphragm as to maintain positive pressure thereon,

a closure for said first chamber,

a second chamber in said closure said second chamber being in communication with said first chamber,

a second bore in said closure said second bore extending from said second chamber and through said closure at an angle to the longitudinal axis of said elongated member and adapted to have a disposable tube inserted therein, and

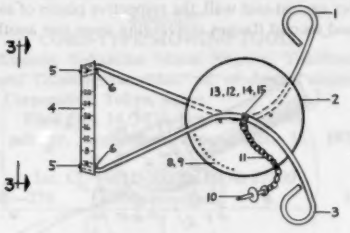
operating means for moving said movable means towards said resilient diaphragm to increase the pressure thereon and expel air from said first chamber, the relative size of said first chamber and the distance of movement of said movable means is such that the change in volume of the first chamber on movement of the movable means away from said resilient diaphragm is such that only a few drops of liquid are drawn into the tube and no liquid is allowed to enter the chambers.

4,043,043

DEVICE FOR MEASURING THE AMOUNT OF PRODUCT IN BOTTLES, JARS AND CONTAINERS

Aylmer Raymond Pace, 2418 Otis Drive, Alameda, Calif. 94501

Filed Nov. 3, 1975, Ser. No. 628,610
Int. Cl.[2] G01F *19/00;* **G01B** *3/10*
U.S. Cl. 33—137 L **3 Claims**



1. A combination comprising:

a. a pair of elongated members having one end of each member bent to form a handle portion, the opposite end of each member forming a leg, said members being pivotally attached to one another at a point intermediate the ends of each member, and each member being bent such that as the handle portions's are closed toward each other the leg portions are moved apart;

b. an elastic stretchable elongated member connected at its ends to the ends of said legs, said elastic member having a scale thereon so that as the legs are moved apart the scale on said elastic member is stretched;

c. locking means having predetermined locking positions to lock the elongated members in predetermined locked positions, each of said predetermined locked positions providing a predetermined separation distance for the ends of said legs; and

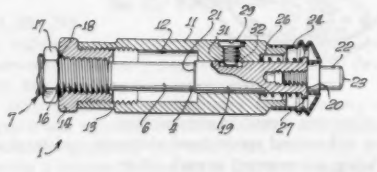
d. second adjustment means which provide an additional predetermined adjustment of the separation distance so that upon locking of said legs in one of said locked positions by said locking means, said second adjustment means can add the distance of said predetermined adjustment to the separation distance of the ends of said legs, said locking means having reference characters adjacent each of said locking positions.

4,043,044

SURFACE-FOLLOWING CARTRIDGE FOR USE WITH LINEAR MEASUREMENT TRANSDUCER SYSTEMS

Jan Valgene Whitehead, Montclair; Frederick J. Reininger, Ontario, and Arthur Lawrence, Upland, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 24, 1975, Ser. No. 634,576
Int. Cl.[2] G01B *3/22, 5/00*
U.S. Cl. 33—172 E **7 Claims**



1. Surface-contacting electronic micrometer gage apparatus for linearly measuring surface contours, comprising:

a transducing measuring system including an elongate transducer member having an active element providing an electrical output proportional to variations in the displace-

ment of the element from the surface of a conductive material

an elongate tubular casing having one of its end portions detachably receiving (adapted to retainably receive) said active element,

means for adjusting the received length of said transducer member (portion),

a plunger reciprocably mounted in the other end portion of said casing, said plunger having an inner end portion formed of a conductive material and an outer end portion adapted to contact and follow a surface to be measured,

resilient means reciprocably urging said plunger outwardly of said casing, and

abutment means carried by the casing for physically limiting the extent of the resiliently-urged (limiting the) outward travel of said plunger,

whereby said transducer member can be adjustably disposed in said casing with its active element fixed a spaced distance from said conductive material at the inner end of the plunger for physically limiting its inward reciprocal movement, said outer end of the plunger projecting outwardly of said casing at said inward limit for resiliently following contacted surface contours,

said spacing of said (transducer) active element being fixed in accordance with the displacement range of the transducer member and said electrical output of said (transducer) active element varying responsively to the variations in said spacing produced by said surface following plunger.

4,043,045

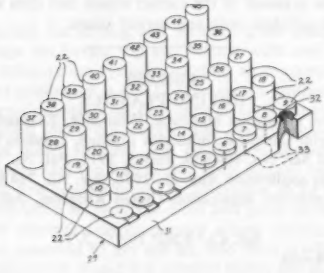
SINE BAR GAGE SET AND ASSEMBLY WITH DIRECT-READING ANGLE INDICIA

Joseph M. Rodriguez, San Jose, Calif., assignor to Select Metal Products Inc., Santa Clara, Calif.

Filed Mar. 29, 1976, Ser. No. 671,566

Int. Cl.[2] G01B *3/32*

U.S. Cl. 33—174 S **3 Claims**



2. A carrying tray for holding each of a predetermined number of gage bar elements forming a set thereof, said tray including a base of predetermined thickness, openings formed into said base to snugly receive each of the gage elements of the set, and vent openings coupling the bottoms of said first named openings to the surrounds when the elements are disposed within said first named openings to prevent the gage elements from being retained by vacuum within the first named openings.

4,043,046

EDGE FINDER PROBE

Charles F. Thomas, 1016 Bahama Drive, Orlando, Fla. 32806

Filed Mar. 25, 1976, Ser. No. 670,147

Int. Cl.[2] G01B *5/25;* **B27G** *23/00*

U.S. Cl. 33—185 R **9 Claims**

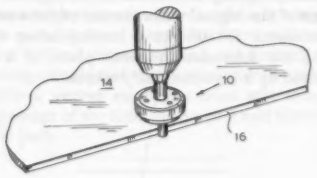
1. An edge indexing device for locating an edge surface of an article positioned adjacent thereto, said edge indexing device comprising:

a housing having a cylindrical bore therein, said bore being defined by a bore axis centered therein and a bore radius;

a cylindrical shaft having a circumferential surface for communicating within and protruding from said bore of said housing, with said cylindrical shaft being defined by a shaft axis centered therein and a shaft diameter equal to said bore radius, with a protruding section of said circumferential surface of said cylindrical shaft communicating with said edge surface of said article positioned adjacent thereto; and

parallel means for movably coupling said cylindrical shaft within said bore with said shaft axis parallel to said bore axis for permitting lateral movement of said cylindrical shaft within said bore, whereby said circumferential surface of said cylindrical shaft locates said edge surface about a line defined by an extension of said bore axis.

3. An edge indexing device for locating an edge surface of an article positioned adjacent thereto, said edge indexing device comprising:



a housing having a first cylindrical cavity therein defined by a first cavity axis coaxially therethrough and a first cavity radius;

locating means having a first cylinder defining a first circumferential surface for circumferentially communicating within said first cylindrical cavity of said housing, said locating means having a second cylinder defining a second circumferential surface for circumferentially communicating with said edge surface of said article positioned adjacent thereto, said first circumferential surface having a first radius and said second circumferential surface having a second radius, with said first and second cylinders being coaxially coupled about a common longitudinal axis therethrough, and with the sum of said first radius and said second radius being equal to said first cavity radius; and

parallel means for movably coupling said first cylinder within said first cylindrical cavity with said common longitudinal axis being parallel to said first cavity axis for permitting lateral movement of said locating means with respect to said first cavity axis, whereby said locating means moves to locate said edge surface of said article positioned adjacent thereto along an extension of said first cavity axis of said housing.

4,043,047

PROCESS AND APPARATUS FOR THE TREATMENT OF WATER-CONTAINING SUBSTANCES AND APPLICATION OF THIS METHOD FOR THE PREPARATION OF PASTEURIZED DRIED SLUDGE

Joseph Galliker, Wettingen, Switzerland, assignor to Patelhold Patentverwertungs- & Elektro-Holding AG., Glarus, Switzerland

Filed Feb. 6, 1976, Ser. No. 656,008

Claims priority, application Switzerland, Mar. 3, 1975, 3417/75

Int. Cl.[2] F26B *3/34*

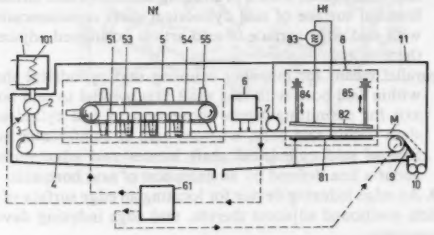
U.S. Cl. 34—1 **14 Claims**

1. Process for the treatment of a water-containing substance which comprises

conveying the substance to a first treatment station;

extracting a portion of the water from the substance within said first station by electrolytically heating the substance in such manner that the substance is guided through elongated electrodes which are energized by alternating current for heating purposes;

conveying the so pre-desiccated material to a second treatment station;



dielectrically heating the substance through all but a few percent of the original water content of the water-containing substance the dielectric heating being effected by passing the substances between plates of a condenser energized by a high-frequency source.

4,043,048

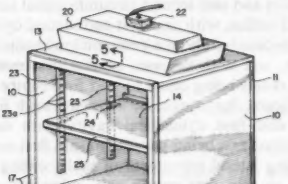
LABORATORY DRYING OVEN AND METHOD

Vallon C. Veater, 264 E. First North, Salina, Utah 84654

Filed Jan. 28, 1976, Ser. No. 653,231

Int. Cl.² F26B *3/30, 19/00*

U.S. Cl. 34—4 **10 Claims**



7. A method of drying a mass of discrete matter constituting a test sample, comprising placing said mass on material-supporting means of the nature of a shelf below one or more infrared heat lamps in a drying oven having side, back, bottom, and top walls defining a heating chamber with its front entirely and permanently open over the area extending between said side, bottom, and top walls and with ventilation openings disposed in said back wall at spaced intervals and comprehending a substantial portion of the area of said back wall rearwardly of the open front; energizing said heat lamps so a draft of air will sweep through said chamber from and substantially throughout the area of the open front thereof across the test sample and out of the chamber through said ventilation openings rearwardly of said open front; and removing the test sample from the drying oven through said open front following the drying thereof.

4,043,049

PROCESS AND APPARATUS FOR FLASH DRYING FLUFFED CELLULOSE PULP

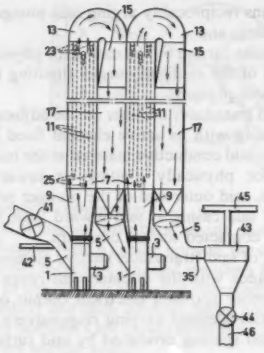
Bengt Olof-Arvid Hedstrom, 4, Hultgrensgatan, S-412 59 Goteborg, Sweden

Continuation-in-part of Ser. No. 559,278, March 17, 1975, abandoned. This application Sept. 18, 1975, Ser. No. 614,568

Claims priority, application Sweden, Mar. 22, 1974, 7403903

Int. Cl.² F26B *3/08, 3/10, 17/00*

U.S. Cl. 34—10 **15 Claims**



1. In the process for the flash drying of particulate cellulose pulp, comprising the steps (1) entraining the pulp particles in a gas, (2) establishing and maintaining a flow of the gas-particulate cellulose pulp mixture along a confined path, (3) transferring heat into the gas-particulate cellulose pulp mixture in a heat-transfer zone along the path, and (4) repeating step (3) in a successive series of heat-transfer zones, the improvement which comprises employing as the carrier gas steam under a pressure of at least 0.12 to 0.15 MPa; supplying heat to the heat-transfer zone as heating steam whose saturation pressure exceeds the pressure of the carrier steam; and then separating the fluffed cellulose pulp and carrier steam.

4,043,050

DRYING PLASTICS

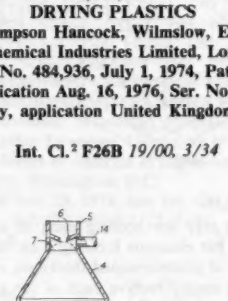
Frank John Thompson Hancock, Wilmslow, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 484,936, July 1, 1974, Pat. No. 3,986,269. This application Aug. 16, 1976, Ser. No. 714,808

Claims priority, application United Kingdom, July 4, 1973, 31768/73

Int. Cl.² F26B *19/00, 3/34*

U.S. Cl. 34—48 **8 Claims**



1. Apparatus comprising

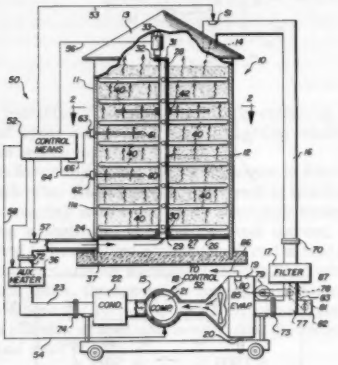
a. a hopper having (i) a vertical cylindrical portion, and connected therebeneath, (ii) a conical base portion provided with (iii) an outlet orifice, said conical base portion being provided with a plurality of perforations adjacent the outlet orifice,
b. means to supply air to said perforations,
c. electric heaters arranged to heat the air supplied to said perforations,
d. a proportional temperature controller having an integral term and a derivative term,
e. a thermocouple positioned to respond to the temperature of the air after passage past the heaters and connected to actuate the controller which is arranged to control the electrical heaters.

4,043,051

METHOD AND APPARATUS FOR DRYING GRAIN

Delbert Lussenden, 2307 Gideon Ave., Zion, Ill. 60099

Filed Feb. 24, 1975, Ser. No. 552,360
Int. Cl.² F26B *21/08*
U.S. Cl. 34—77 **13 Claims**



1. Apparatus for drying and aerating grain comprising: a grain storage bin having top and bottom walls and side wall means, a refrigeration system including an evaporator, compressor and condensor, a first conduit means positioned about said refrigeration system for providing an air flow path from an inlet adjacent said evaporator, over said compressor and through an outlet adjacent said condensor, second conduit means between said top wall of said grain storage bin and said inlet of said first conduit means for providing an air flow path for moisture-laden air removed from said grain storage bin to be directed through said evaporator where moisture is condensed and removed to dry the air, and third conduit means between said outlet of said first conduit means and said bottom wall of said grain storage bin for directing dry air, which has been heated while passing through said first conduit means, into said grain storage bin for drying and aerating the grain stored therein, and said second conduit means including air flow control means for venting said moisture-laden air into the atmosphere prior to entering said inlet and for drawing outside air into said evaporator.

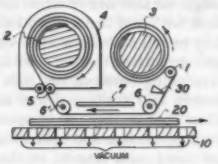
4,043,052

METHOD AND APPARATUS FOR FIXING TONER IMAGES

Satoru Honjo, and Osamu Fukushima, both of Tokyo, Japan, assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 344,383, March 5, 1973, Pat. No. 3,942,266. This application Nov. 20, 1975, Ser. No. 633,897
Int. Cl.² F26B *11/02*
U.S. Cl. 34—122 **4 Claims**

1. Apparatus for the solvent vapor fixing of toner images, comprising a web formed of absorbent material, means for traversing said web over a predetermined path, a first roll for storing a supply of said web material, a second roll for receiving said web material after traversing said path, means for wetting said web with solvent during said traversing, means for locating a toner image in closely spaced juxtaposition to said web over a portion of said predetermined path, means for guiding said web material over said portion of said predetermined path, means for wetting said web with said solvent in its



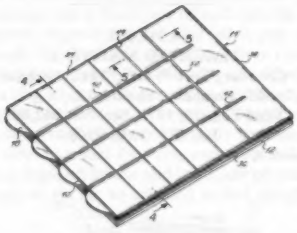
traverse from said first roll to said guiding means, said web being wet with a volatile solvent for said toner during its traverse over said portion of said path, and a housing containing said web material when wet with solvent, said second roll being located within said housing, and said first roll and guiding means being outside said housing, whereby a toner image is fixed by solvent vapors emanating from said web material during the passage of the toner image past said portion of said web material path.

4,043,053

EDUCATIONAL GAME

Steven Kaye, 66 Empress Pines Drive, Ronkonkoma, N.Y. 11779

Filed Oct. 16, 1975, Ser. No. 622,839
Int. Cl.² G09B *5/02*
U.S. Cl. 35—8 R **1 Claim**



1. An educational game comprising:
a transparent sleeve formed of front and rear sheets of transparent plastic secured to each other along two spacedly opposed side edges thereof and along at least one visible line intermediate with and substantially parallel to said joined side edges, said at least one intermediate line, in combination with said side edges, defining at least two separate column-forming compartments in said sleeve;
a transparency being adjustable beneath and being juxtaposed with said sleeve and having a plurality of legends arranged thereon in columns, each said column being adjustable by the adjustment of said transparency for substantial alignment with a respective one of said sleeve column-forming compartments;
an opaque slide removably contained in each said columnar compartment and movable therewithin, each said column of legends on said transparency being adjustable for registry with one said slide such that movement of said slide withdrawing the same from within said sleeve columnar-compartment exposes the legend on said transparency adjusted for registry with said corresponding column;
said sleeve having two spacedly opposed end edges, one of

which is open for receiving said slides, and an additional visible line sealing said front and rear sheets to each other, said additional line being substantially perpendicular to and extending between said side edges and spaced inwardly of said other end edge to thereby define stop means for the inward insertion of said slides and further defining a heading margin for each said column of legends of said transparency, there being a heading on said transparency corresponding to the subject matter for each said column of legends with said heading being in registry with a heading margin on said sleeve when said transparency is in juxtaposition with and beneath said sleeve;

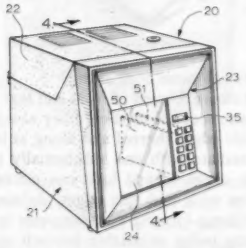
said sleeve being provided with a least one further visible line on at least one surface thereof substantially perpendicular to and extending between said side edges and being disposed between said additional line and said open end edge, said at least one further line cooperating with said at least one intermediate line and said additional line to define a grid so sized with respect to the legends on said transparency that said transparency can be adjusted to expose individual legends through individual squares of said grid;

and means for projecting one of said legends in any one of said columns onto a viewing surface when said slide that is in registry with the projected legend is at least partially withdrawn from its respective compartment;

said transparency being unconnected with and free of guidance by the sleeve, yet adjustable beneath the sleeve with the transparency being movable relative to the sleeve so as to position the legends on said sleeve in substantial alignment with respective columns of said sleeve in which the slide moves to expose the legends of said transparency for viewing and for light transmission by said projecting means;

whereby said transparent sleeve is reusable with another changed transparency having a plurality of different legends arranged thereon in columns by adjusting said other transparency in juxtaposition with and beneath said sleeve.

4,043,054
TEACHING MACHINE
Norman A. Crowder, Fort Worth, Tex., assignor to Sargent-Welch Scientific Company, Skokie, Ill.
Filed Feb. 13, 1974, Ser. No. 442,087
Int. Cl.[2] G09B *7/08*
U.S. Cl. 35—9 A **3 Claims**



1. In a teaching machine of the type which displays selected frames from a multiple frame film strip wherein instructional material is contained on first portions of said frames and code indicia, including an excursion instruction for proceeding to a subsequent frame to be displayed, is contained on second portions of said frames, a film transport comprising:

means including a projection gate for displaying the first portion of individual ones of said frames when aligned in said projection gate;

a supply reel for storing said film strip in a rewound position;

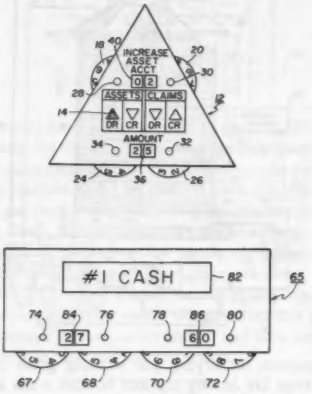
a take-up reel for receiving said film strip;

film drive means for advancing said film strip from said supply reel, through said projection gate, and onto said take-up reel;

a permanent leader comrpising in length a plurality of frames and extending in a home position from a point of engagement with said film strip through said projection gate to said take-up reel, the frame of said leader then in said projection gate being a predetermined number of frames from the first viewing frame of said film strip and having a related initial excursion instruction on said leader; and

automatic loading means responsive to said initial excursion instruction for causing said film drive means to advance said leader said predetermined number of frames from said home position to position said first viewing frame of said film strip in said projection gate.

4,043,055
TEACHING AID FOR ACCOUNTING
Snyder M. Zegel, 108 Monell Ave., Islip, N.Y. 11751
Filed Oct. 20, 1975, Ser. No. 624,005
Int. Cl.[2] G09B *19/18*
U.S. Cl. 35—24 R **3 Claims**



1 A teaching device useful as an aid in teaching the rudimentary principles of accounting comprising:

a. a plurality of account ledger recording devices;

b. means for labeling each account ledger recording device;

c. a triangular journal device bearing accounting indicia thereon;

d. a plurality of disks bearing numerals thereon and rotatably attached to said journal device; and

e. window means on said journal device for displaying therethrough the numerals on said disks representing the amount to be posted to a particular account ledger recording device.

4,043,056
MAKE A FACE GAME
Jerry D. Savage, 95 Fountain Lane, Apt. No. 3, S. Weymouth, Mass. 02190
Filed Nov. 2, 1976, Ser. No. 738,378
Int. Cl.[2] G09B *1/28*
U.S. Cl. 35—28 **2 Claims**

1. A game for forming a variety of designs such as faces, scenes, etc., said game comprising:

a. a frame having oppositely disposed outer ends with a vertically extending channel therebetween with an upper edge and lower edge and an opening extending transversely therethrough for viewing a design therein.

b. a stand connected to said frame at the lower end thereof for vertically supporting same,

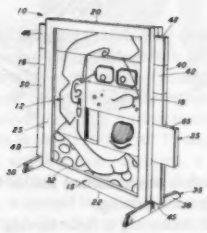
c. said stand includes a leg at each end of said frame extending transversely thereto,

d. a set of inserts having a rectangular configuration which when assembled in proper orientation to each other forms a single design thereon on each of the opposite sides thereof, said inserts being of a width to slide horizontally within said channel and between said upper and lower edges thereof and extending beyond said outer ends of said frame when assembled,

e. said set of inserts includes:

1. an upper insert and lower insert extending the width of said frame and beyond said outer ends,

2. a middle insert extending between said upper and lower inserts, and



3. a plurality of intermediate inserts extending between said upper and lower inserts in abutting relationship to said middle insert,

f. means for coupling said assembled inserts in fixed position to each other when properly positioned in said frame, and

g. said coupling means includes a vertically extending pin having a shaft and head at one end thereof, said pin adapted to be received adjacent each end of said inserts in aligned apertures for assembling same in fixed relationship to each other, the top insert having an aperture with a counterbore for receiving said head of said pin therein, and a plurality of apertures in said other inserts for receiving said shaft therein.

4,043,057

TEACHING AID

Gerald W. Guswiler, Box 282, Penney Farms, Fla. 32079

Filed July 23, 1976, Ser. No. 708,273

Int. Cl.[2] G09B *1/22*

U.S. Cl. 35—74 **1 Claim**

1. An arithmetic teaching aid comprising a front and a back sheet of sheet material, said sheets being of the same size and of the same rectangular shape and in superposed alignment, a respective spacing lug disposed between said sheets at each of the four corners thereof, a first disc of sheet material having a diameter equal to substantially the width dimension of said sheets and disposed therebetween and centered with respect to the side edges of said sheets and having an edge portion projecting from one end edge of said sheets for manual rotation thereof, two series of smaller sheet material discs, each series comprising three such smaller discs and said smaller discs having equal diameters equal to substantially one half of said width dimension, said smaller discs of each said series being disposed between said sheets and along a respective said side edge of said sheets and with an edge portion of each said smaller disc exposed for manual rotation thereof at the respective said side edge, respective mounting means passing through the center of each said disc and rotatively mounting each respective disc to said sheets, the centers of the three discs of each said series being spaced equally inwardly of the respective said side edge of said sheets and being spaced apart each to the next disc of the series by a distance less than the diameter and greater than the radius of such discs and the center one of the three discs of each said series being disposed in a plane closer to one of said sheets than the other two discs of the respective series whereby said one disc of each said series laps with said other two discs, each said disc of each said series being aligned opposite to a corresponding said disc of the other said series, the centers of said corresponding discs being located apart by slightly more than the diametrical dimension of said smaller discs to provide a small clearance distance between their perimetrical edges midway between said side edges of said sheets, said front sheet being provided with a column of window openings which, when said sheets are in upright position with the end edge opposite said one end edge at the top, is upright, extends downwardly from adjacent said top edge and is centered between said side edges and which said column comprises three pairs of window openings, the openings of each said pair being closely adjacent each other and aligned side-by-side between said centers of respective said corresponding discs, each of said smaller discs having numerals from 0 to 9 thereon arranged in a ring adjacent its periphery and said numerals of each disc being located alignably with a respective said window opening to be visible individually seriatim through the respective window opening with rotation of the disc, whereby, when viewing said front face in such upright position, one pair of side-by-side digital numerals appear in an upper pair of said window openings aligned above another pair of such numerals in an intermediate pair of said window openings and a third pair of such side-by-side ditigal numerals appear alignedly below said other pair of such numerals through the third said pair of window openings, said first disc being provided with a plurality of arithmetic indicia disposed in a ring adjacent its periphery, said front sheet being provided with a further window opening aligned with said last ring for exposing said indicia individually seriatim with rotation of said first disc, said first disc and said further window opening being disposed below said third pair of window openings when said sheets are so oriented in said upright position.

4,043,058

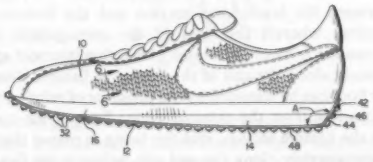
ATHLETIC TRAINING SHOE HAVING FOAM CORE AND APERTURED SOLE LAYERS

Geoffrey L. Hollister, and Dennis E. Vixie, both of Eugene, Oreg., assignors to BRS, Inc., Beaverton, Oreg.

Filed May 21, 1976, Ser. No. 688,843

Int. Cl.[2] A43B *1/10, 13/18;* A43C *15/00*

U.S. Cl. 36—102 **26 Claims**



1. An athletic shoe comprising:

a shoe upper;

an outer sole including a ground engaging bottom surface under the heel, toe and arch portions of said shoe;

an intermediate sole layer provided between said outer sole

and said upper, said intermediate sole layer including an outer border portion of resilient material surrounding an inner core portion of softer and less dense resilient synthetic foam material than said border portion provided within an opening through said intermediate layer and extending along the length of the shoe so that said foam core is positioned beneath the heel, arch and toe portions of said shoe;

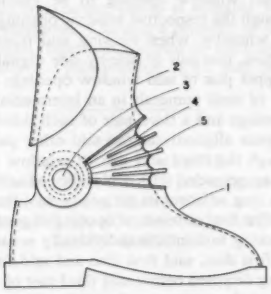
an apertured heel lift sole layer of resilient material provided between said outer sole and said upper and positioned beneath the heel portion, said heel lift layer including a plurality of apertures extending completely through the heel lift layer, said apertures being of a width greater than the maximum thickness of said heel lift layer, and having at least some of said apertures in alignment with said inner core in said intermediate sole layer.

4,043,059

SKI BOOT-IMPROVED MEANS TO CHANGE FLEXIBILITY

Richard Kenneth Rathmell, 12 Pinetree Road, Ramsey, N.J. 07446

Filed May 3, 1976, Ser. No. 682,291
Int. Cl.[2] A43B *5/04*
U.S. Cl. 36—121 **8 Claims**



1. A ski boot which by itself is relatively flexible in the forward-backward direction, but can be stiffened by the addition of a removable stiffening member, said boot having elements that include:

a. a foot-covering section,

b. a leg-holding section,

c. hinges or flexible elements on each side of the boot connecting the leg-holding section to the foot-covering section,

d. a flexible corrugated section across the front of the boot between the leg-holding section and the foot-covering section, wherein the lines of the corrugations extend across the front of the boot in planes that intersect approximately along the axis of the hinges or flexible elements,

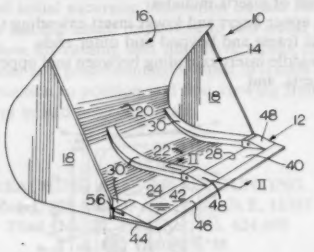
and the boot can be identifed by the presence of relatively rigid fins projecting from the external crease lines of the corrugations in the flexible section, said fins being in planes that intersect approximately along the said axis, wherein the fins themselves do not interfere with the flexibility of the flexible corrugated section when the leg-holding section is strained forward relative to the foot-covering section, but the fins are useful in association with a removable stiffening member that may be positioned between the fins to stiffen the boot.

4,043,060

COMBINATION STRENGTHENED LOADER BUCKET AND REPLACEABLE CUTTING EDGE

Visvaldis A. Stepe, Willow Springs, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 30, 1976, Ser. No. 718,734
Int. Cl.[2] E02F *9/28*
U.S. Cl. 37—141 R **5 Claims**



1. A combination strengthened loader bucket and replaceable cutting edge comprising:

a bucket shell including a floor having an upper surface, a lower surface, and a leading edge;

at least two strengthening members weldably secured to said upper surface of the floor in longitudinally extending and laterally spaced apart relation and individually having a nose portion thereon, said nose portions extending forwardly of said leading edge and being elevationally disposed fully above said upper surface of the floor; and

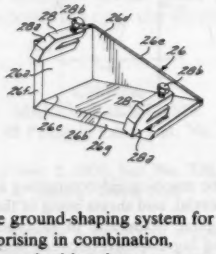
a replaceable cutting edge having a blade with an upper surface and a lower surface and including at least two housing elements weldably secured to said upper surface of the blade and providing therewith at least two sockets individually adapted to receive said nose portions of said strengthening members interlockingly therein and so constructed and arranged that said upper and lower surfaces of the blade are generally coplanar respectively with said upper and lower surfaces of the floor.

4,043,061

GROUND-SHAPING SYSTEMS FOR A BACKHOE BUCKET

LeRoy Marvin Heitman, 28900 Ironwood, Sunnymead, Calif. 92388

Filed Apr. 21, 1976, Ser. No. 678,870
Int. Cl.[2] E02F *5/02*
U.S. Cl. 37—141 R **7 Claims**



1. A detachable ground-shaping system for use with a backhoe bucket, comprising in combination,

a main body formed with at least two ground-cutting members and a back plate engaging each of said ground-cutting members along the length thereof,

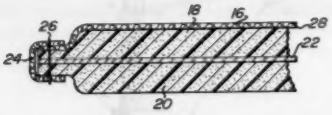
and a pair of clamps fixed to said main body to be firmly secured to said bucket to retain said back plate there against throughout its length.

4,043,062

IRONING PAD

David Lehrman, Cheltenham, Pa., assignor to The Ironees Company, Philadelphia, Pa.

Filed May 26, 1976, Ser. No. 690,228
Int. Cl.[2] D06F *81/14*
U.S. Cl. 38—140 10 Claims



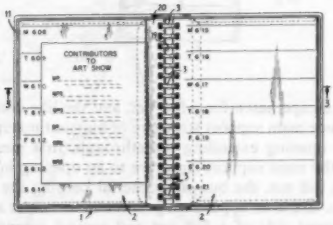
10. An ironing pad adapted to be placed on a support surface for ironing, comprising an upper surface of a layer of heat resistant fabric, a first layer of foam polymeric material underlying said fabric and being adhesively bonded thereto by a thermoplastic adhesive such that during ironing, softening of said adhesive occurs at about 200°–250° F, allowing the pad to be maintained in a wrinkle free condition, a vapor and heat barrier layer of metal foil underlying said first layer of foam polymeric material, a second layer of foam polymeric material underlying said metal foil and providing a skid resistant bottom for said pad for preventing the pad from moving on said support surface during ironing and means joining the peripheral edges of all of said layers of said pad together.

4,043,063

APPOINTMENT CALENDAR BOOK

Emilio Ambasz, New York, N.Y., assignor to Center for Design Research and Development N.V., Curacao, Netherlands Antilles

Filed Mar. 30, 1976, Ser. No. 671,832
Int. Cl.[2] G09D *3/04*
U.S. Cl. 40—119 2 Claims



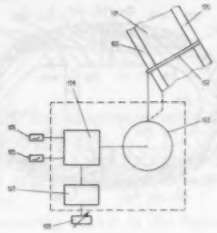
1. In an appointment calendar book having a multiplicity of pages bearing indicia of dates thereon and ring-type binder means having elements passing through the pages for securing the pages to form a book, the improvement comprising as at least one page of the book a page-like structure having a pocket closed along its margins except along an opening that is closely adjacent the edge of the structure through which said elements of the binder means pass ahd having a flap joined intergrally to said edge and folded to overlie a portion of said page-like structure adjacent said edge, the flap being of a width such that it is adapted to be partially received in the pocket through said opening, and the elements of the binding means passing through the flap and a part of the structure which is non-pocketed but not passing through the pocket, and an insertion received in the pocket of the page-like structure.

4,043,064

COPYHOLDER

Gershon Friedman, Seestrasse 34, 8803 Ruschlikon, Switzerland

Filed Sept. 19, 1975, Ser. No. 615,090
Claims priority, application Switzerland, Sept. 26, 1974, 13017/74
Int. Cl.[2] B41J *11/44, 29/00*
U.S. Cl. 40—343 6 Claims



2. A copyholder comprising

an indicator extending transversely over a copy surface,

means for effecting movement of said indicator relative to said copy surface, said means including electrical driving means,

a control unit for effecting operation of said electrical driving means,

a first actuating means for initiating actuation of said control unit and stopping means for automatic delivery of a stopping signal to said control unit,

a second actuating means for initiating and stopping actuation of said control unit independent of said first actuating means and stopping means,

means for supplying an actual-value signal analogous to the position of said indicator associated with said indicator,

means for supplying a predetermined rated-value signal, and

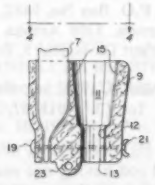
means associated with said stopping means for comparing said actual-value signal supplied by said actual-value signal supplier with the predetermined rated-value signal for issuing a stopping order if said actual-value and said rated-value correspond.

4,043,065

PISTOL CHARGING SOCKET

Daniel Dennis Musgrave, 8201 Caraway St., Cabin John, Md. 20731

Filed Oct. 13, 1976, Ser. No. 732,070
Int. Cl.[2] F41C *27/00, 33/02*
U.S. Cl. 42—1 R 6 Claims



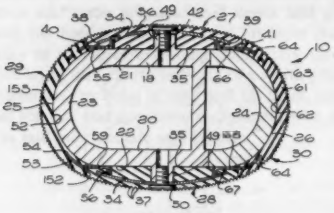
1. A charging device for a pistol charged by relative motion between a frame and a slide, comprising: a holster; external socket means on said holster positionally adapted for enclosing a portion of said slide and for blocking movement of said slide toward the lower extremity of said holster; and passage means in said socket means positionally adapted to accommodate a barrel protruding through the front of said slide during charging.

4,043,066

PISTOL GRIP

Frank A. Pachmayr, Los Angeles, and Jack R. Farrar, Whittier, both of Calif., assignors to Pachmayr Gun Works, Inc., Los Angeles, Calif.

Filed June 7, 1976, Ser. No. 693,424
Int. Cl.² F41C *23/00*
U.S. Cl. 42—71 P **19 Claims**



1. A pistol grip comprising:

two side panels to be recieved at opposite sides of a pistol handle and each including a boy of elastomeric material having an outer surface to be gripped by a user; and

a cross strap adapted to extend laterally between said side panels adjacent the handle and including elastomeric material presenting an exposed gripping surface;

said cross strap having a connector portion which extends to a location at the inner side of one of said panels and which has an interlocking projection extending laterally outwardly away from the pistol handle and toward said one panel;

said one panel having a shoulder at its inner side which extends inwardly toward the pistol handle to a position opposite said projection in generally a front to rear direction and in a relation positively blocking separating movement of said connector portion of the cross strap from said one panel.

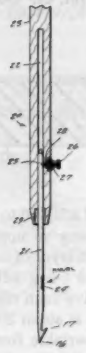
4,043,067

SUPER FROG GIG

George J. Konucik, P.O. Box No. 9482, Richmond, Va. 23228; Thomas B. Robertson, 1206 Arnoka Road, Mechanicsville, Va. 23111, and Robert Davis, Rte. 5, Box 1588, Powhatan, Va. 23139

Filed Mar. 4, 1976, Ser. No. 663,920
Int. Cl.² A01K *81/04*
U.S. Cl. 43—6 **2 Claims**

1. A super frog gig, comprising, in combination, an elongated, straight drill rod having one end thereof tapered to a conical point and inserted into an end of a wooden handle, an opposite end of said drill rod incorporating a means for piercing through a frog during a frog hunt; said means comprising said opposite end having a flat face on opposite sides thereof so as to form a relatively flat blade, said flat blade having a tapered point upon an end thereof and a sidewardly extending offset hook, said drill rod being retractable within said end of said handle, said end of said handle having an elongated opening that is equal to a length of said drill rod, a transverse set screw threaded in said handle having a conical point which selectively engages a notch in a side of said drill rod when said drill rod is in an extended position, and said conical point of



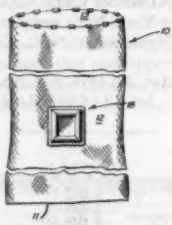
said set screw engaging a knurled surface of said drill rod when said drill rod is in a retracted position.

4,043,068

ESCAPE HATCH FOR FISH NET

Forest J. Savoie, Rte. 1, Box 365, Cut Off, La. 70345

Filed Apr. 20, 1976, Ser. No. 678,684
Int. Cl.² A01K *73/02*
U.S. Cl. 43—9 **10 Claims**



1. An escape hatch for a fish net, and the like comprising; a single piece main support structure of buoyant material having a center opening extending therethrough, first means for attaching the main support structure to an opening in the upper side of a fish net, the buoyant material keeping the main support structure in an uppermost position in the water as attached to the upper side of a fish net and second means for semi-automatically closing the central opening in the main support structure when the fish net is being trolled to catch marine life therein, including a closure cover attached to the main support structure by mounting means which will permit the desired closure action to take place.

4,043,069

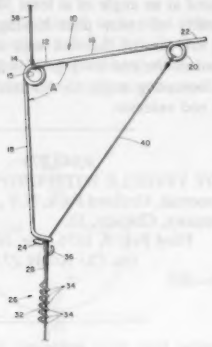
FISH HOOK SETTING DEVICE

Marvin L. Zahner, 421 N. Osage Dr've, Skiatook, Okla. 74070

Filed June 25, 1976, Ser. No. 699,715
Int. Cl.² A01K *97/00*
U.S. Cl. 43—15 **8 Claims**

1. A fish hook setting device comprising an elongated tempered wire formed into two elongated leg members joined by a spring loop, said leg members extending radially outwardly from said spring loop in a relaxed position, an eye formed in the

first leg member adjacent the outer end thereof and having a short end piece extending beyond said eye, an elongated trigger member being pivotally attached at one end to the outer end of the second leg member, said trigger member comprising



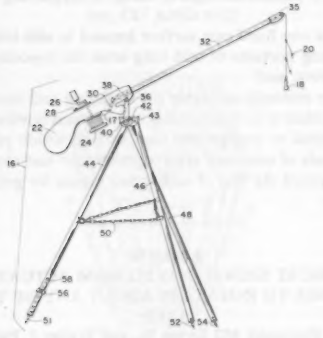
latch means secured adjacent said pivot attachment and engageable with the short end piece when the leg members are compressed together, the free end portion of the trigger member having a plurality of longitudinally spaced fishing line carrying means therealong.

4,043,070

ICE FISHING ROD

Aimé Lamothe, Cap de la Madeleine, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Apr. 5, 1976, Ser. No. 673,747
Int. Cl.[2] A01K *97/10*
U.S. Cl. 43—21.2 **7 Claims**



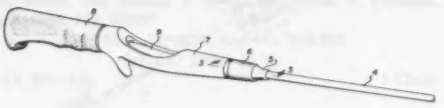
1. An ice fishing rod, comprising:
a handle,
a fishing reel crank attached through the handle,
a fishing reel attached to a distal end of the fishing reel crank,
means of locking the fishing reel in a specific position attached to the crank handle near a proximal end of the crank handle,
a hollow rod attached to the handle,
means of conveying a line attached to the reel through the handle and through the hollow rod and retractably extensible through a distal tip of the hollow rod,
a tripod, and
means of attaching the handle and rod to the tripod.

4,043,071

FISHING ROD ASSEMBLY

Joseph A. Lando, Long Grove, Ill., assignor to Land-O-Tackle, Harwood Heights, Ill.

Filed June 11, 1976, Ser. No. 695,249
Int. Cl.[2] A01K *87/02*
U.S. Cl. 43—23 **4 Claims**



1. A grip, handle and adapter assembly for a fishing rod which includes, in combination,
a handle portion having a well for a reel, a forward end and a rear end, a grip portion fixed to said rear end of the handle portion,
a cylindrical mounting socket in the forward end of said handle portion, said mounting socket having an annular edge at the end of the handle portion,
an adapter member having a body portion and a cylindrical plug portion of reduced diameter relative to said body portion, a continuous shoulder between said body portion and said plug portion, said plug portion having an end wall remote from said continuous shoulder and said body portion having a face remote from said continuous shoulder, a rod passageway extending inwardly from said face to receive a rod in bonding relationship,
said rod passageway extending along the length of said body portion and into said cylindrical plug portion but terminating short of a threaded bore which extends inwardly from an end wall of said cylindrical plug portion, said cylindrical mounting socket having dimensions complementary to said cylindrical plug portion to allow said cylindrical plug portion to be closely inserted within said cylindrical mounting socket,
a threaded shank extending upwardly from the bottom of said cylindrical mounting socket and threadedly received within said threaded bore to removably secure said adapter member to said handle portion, and
said cylindrical plug portion having a dimension so that said end wall of said cylindrical plug portion does not contact the bottom of said mounting socket when said continuous shoulder of said adapter member abuts said annular edge of said mounting socket, thereby assuring a tight, substantially unbroken junction between the adapter member and the handle portion.

4,043,072

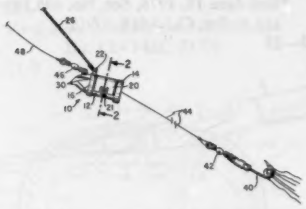
FISH AND LURE RETRIEVER

Letterio Dominic Condurso, 1472 Dwight Place, Bronx, N.Y. 10465

Filed Mar. 10, 1976, Ser. No. 665,431
Int. Cl.[2] A01K *97/00*
U.S. Cl. 43—17.2 **5 Claims**

1. A fish lure retriever comprising a hollow core having a slot therealong, a sleeve also having a slot rotatable with respect to said core, said slots of said core and sleeve admitting a fishing line into the center of the core when aligned and locking the line in the core when offset from each other, means attached to said retriever for connecting an auxiliary line thereto, said core having an open front end to permit the retriever to move along the fishing line and over connecting tackle and a plurality of prongs formed around the entire periphery of the rear end thereof and converging inwardly

toward the center of the core, said slot of said core extending through the area of said prongs, said prongs defining spaced



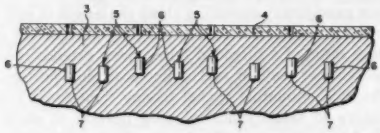
therebetween to catch the connecting tackle as the retriever is pulled upwardly by the auxiliary line.

4,043,073

METHOD OF TREATING SOIL FOR CONTROLLING TERMITES AND THE LIKE

Mario J. Basile, 85-12 Fifth Ave., Brooklyn, N.Y. 11209

Continuation-in-part of Ser. No. 496,363, Aug. 9, 1974, Pat. No. 3,940,875. This application July 24, 1975, Ser. No. 598,655
The portion of the term of this patent subsequent to Mar. 2, 1993, has been disclaimed.
Int. Cl.[2] A01M *1/20*
U.S. Cl. 43—124 **17 Claims**



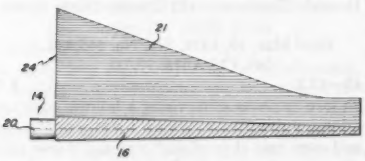
1. The method of providing a signal that insect or rodent pests are present in a localized area comprising dispersing contiguous to said area, a volatile odor forming material enveloped in an imperforate enclosure substantially impermeable to said material, making a portion of said enclosure of a material attractive to and edible by said pest, placing that portion in the area so that any pest in the area adjacent said enclosure would consume said portion and free said odor forming material to produce an odor detectable in said area.

4,043,074

GRAPHITE FIBER FISHING ROD

Tom P. Airhart, Hurst, Tex., assignor to Skyline Industries, Inc., Fort Worth, Tex.

Filed Dec. 31, 1975, Ser. No. 645,650
Int. Cl.[2] A01K *87/00*
U.S. Cl. 43—18 GF **7 Claims**



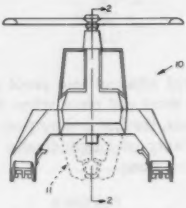
1. A fishing rod having a hollow tapered rod body of generally circular exterior cross-section which tapers from a large diameter handle end to a small diameter tip end, the rod having a hollow interior extending along the rod axis which tapers in the same direction as the exterior of the rod, said rod body being constituted by laminations of a plurality of plies of fiber reinforced resin in which the fibers in each ply have an average tensile strength above 300×10^3 p.s.i., and an average modulus of elasticity greater than 18×10^6 p.s.i. and are parallel to one another, said plies including at least one inner ply having its fibers oriented at an angle of at least 30° to the axis of the rod, and a plurality of outer plies having their fibers generally parallel to the axis of the rod, said outer plies at the large diameter end of the rod having their fibers disposed at a progressively increasing angle to the axis of the rod as they approach the rod exterior.

4,043,075

TOY VEHICLE WITH GRIPPING TONGS

Jack L. Breneman, Orchard Park, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 3, 1976, Ser. No. 654,924
Int. Cl.[2] A63H *27/12*
U.S. Cl. 46—202 **10 Claims**



1. A toy vehicle having gripping tongs and comprising:

a. a pair of tong arms having free ends movable in one plane between a normal open position and a closed position;

b. a movable pivot connecting said tong arms for pivotal motion between said open and closed positions;

c. spring means for biasing said free ends of said tong arms apart into said normal open position in which said free ends can be positioned over an object;

d. said toy vehicle having a housing for supporting said tong arms;

e. at least one fixed cam surface located in said housing for engaging portions of said tong arms on opposite sides of said pivot; and

f. a lever manually operable for engaging and moving said pivot relative to said housing causing said portions of said tong arms to engage said cam surface which pivots said free ends of said tong arms together into said closed position against the bias of said spring means for gripping the object.

4,043,076

ELECTRICAL SIGNAL MECHANISM ACTUATED IN RESPONSE TO ROTATION ABOUT ANY OF THREE AXES

Stanley G. Potrzuski, 452 Elrino St., and Walter J. Potrzuski, 9 N. Montford Ave., both of Baltimore, Md. 21224

Continuation-in-part of Ser. No. 476,038, June 3, 1974, Pat. No. 3,935,669. This application Jan. 14, 1976, Ser. No. 649,218
The portion of the term of this patent subsequent to Feb. 3, 1993, has been disclaimed.
Int. Cl.[2] A63H *33/26*
U.S. Cl. 46—228 **16 Claims**

1. A wheeled object which generates a signal only when in rotation and when in rotation generates a continuous signal, comprising:

wheel support structure;

circuitry mounted upon said wheel support structure including a power source;

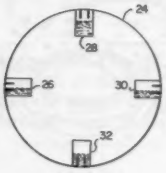
switch means including a first switch which can assume its ON position in response to centrifugal force;

said switch means further including a second switch which assumes it ON position in response to centrifugal force;

means for generating a signal;

means connecting electrically in series said power source, said first switch, said second switch, and said means for generating a signal;

said first switch being mounted upon said wheel support structure in a position such that it is in its ON position as a result of centrifugal force generated when said support structure is in rotation about a given axis; and



said second switch is mounted upon said wheel support structure in a position such that it is in its ON position as a result of centrifugal force generated when said support structure is in rotation about said axis and so that it is in its OFF position when said support structure is not in rotation and when said first switch is in its ON position due to gravity rather than to rotation,

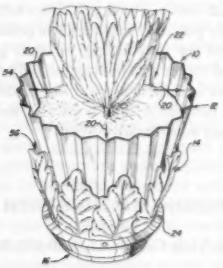
whereby said means for generating a signal is actuated only when said wheel support structure is in rotation and whereby when said support structure is in rotation said means for generating a signal is actuated continuously.

4,043,077

EXPANDABLE POT FOR CONTAINING PLANTS AND METHOD THEREFOR

Clara Francis Stonehocker, 10260 W. 12th Ave., Lakewood, Colo. 80215

Filed May 10, 1976, Ser. No. 684,581
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—66 **5 Claims**



1. A portable container for holding the roots of a plant, said container comprising:

a bottom surface,

flexible side walls attached at one end to said bottom surface, said flexible side walls being open at the end opposing said attached end and being responsive to the growth of said roots for flexing outwardly, said open end being of greater diameter upon expansion than said attached end,

means cooperative with said flexible side walls for stopping the expansion of said container at a predetermined volume in said container, said stopping means including means cooperatve with said flexible side walls for slowing the rate of said expansion prior to said stopping, and

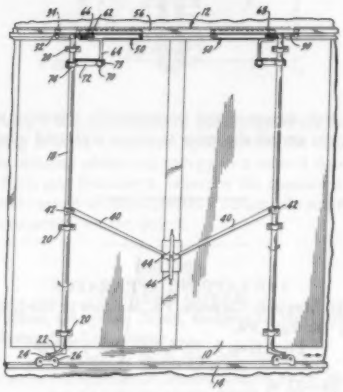
means attached to said bottom surface for collecting excess water in said container.

4,043,078

PLUG DOOR FOR A RAILROAD FREIGHT CAR

Kenneth I. Dyche, 2120 S. Pleasant Valley Road, Srpingfield, Mo. 65804; J. Paul Knox, 5249 Clayhill Drive, Springfield, Mo. 65804, and Ronald I. Swearengin, 4806 S. Fremont, Springfield, Mo. 65807

Filed Mar. 11, 1976, Ser. No. 665,905
Int. Cl.[2] E05D *15/10*
U.S. Cl. 49—220 **1 Claim**



1. In a railroad freight car plug door and supporting structure which includes a door adapted to plug a door opening in the side of the car and wherein the door is moved outward and inward of the door opening by means of cranks fixed to the opposite ends of crank operating rods rotatably supported by brackets mounted on the door, the cranks having arms pivotally supported on means travelling on tracks located above and below the door opening, the upper track being of rectangular cross-section, whereby rotation of the rods swings the cranks which pivot at the tracks to move the door in or out, the improvement characterized by a pair of elongated slide members located in the upper track to travel therein, each slide being a tubular member having a cross-section complemental to that of the upper track, and a linkage pivotally attached at one end to each slide and pivotally secured at the other end to the upper portion of a related operating rod, each linkage being so secured beneath a bracket supporting the related rod on the door.

4,043,079

AUTOMATIC LATCH DOOR APPARATUS

Walter E. Smith, 3773 Casey Drive, Vancouver, British Columbia, Canada (V8Z 4J6)

Filed Dec. 2, 1976, Ser. No. 746,846
Int. Cl.[2] E05B *65/06;* **E05C** *19/02*
U.S. Cl. 49—394 **11 Claims**

1. Automatic latch door apparatus comprising

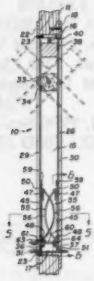
spaced panels forming a closure normally located in a closing position in vertical planes and having adjacent edges movable out of said planes on either side thereof,

latch means on each of said panels near said edge thereof and normally preventing movement thereof in the direction away from the other of said panels while permitting movement in the direction towards said other panel, and

operating means on each panel operatively connected to the latch means on said each panel,

the operating means of each panel being positioned to be

engaged and operated by the other panel when said other panel is moved towards said each panel thereby operating



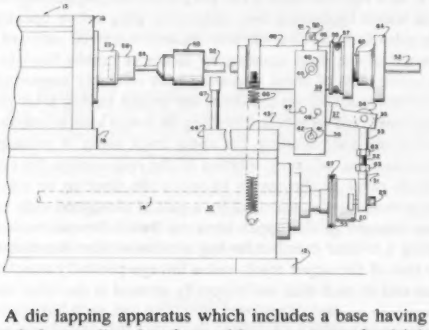
the latch means of and consequently releasing said each panel to permit the latter to move with said other panel.

4,043,080

DIE LAPPING APPARATUS

Thomas H. Maxwell, Carnegie, Pa., assignor to Die-Quip Corporation, Carnegie, Pa.

Filed Oct. 6, 1975, Ser. No. 619,962
Int. Cl.[2] B24B *33/02*
U.S. Cl. 51—33 W **2 Claims**



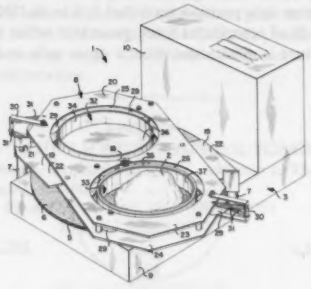
1. A die lapping apparatus which includes a base having a drive shaft extending therefrom with power means for driving the said shaft in one direction and having a headstock mounted on the base and having a rotating die holding chuck extending therefrom rotating in the same direction as the aforesaid drive shaft and wherein a die lapping tool is mounted on a shaft which is simultaneously rotated and reciprocated, the rotation of the shaft having the lapping tool mounted thereon rotating in a different direction opposite the direction of rotation of said drive shaft and die holding chuck, the improvement comprising, a hub mounted for rotation on said drive shaft, a slot extending through said hub, a plate mounted off center the axis of rotation of said drive shaft, said plate adjustably mounted in said slot, a linkage secured to said plate and to a lapping tool carrying shaft to effect a reciprocating motion to said tool carrying shaft, said linkage including a pair of plates pivotally mounted on said base and on a housing in which the lapping tool carrying shaft is mounted for rotation therein and to be simultaneously reciprocated when said hub and plate mounted therein is rotated, and means to effect a rotary motion to said tool carrying shaft while the same is simultaneously reciprocated.

4,043,081

DRY LAP POLISHER

Donald E. DeTray, 10430 Truman Road, Independence, Mo. 64052

Filed Aug. 19, 1976, Ser. No. 716,064
Int. Cl.[2] B24B *37/04*
U.S. Cl. 51—129 **7 Claims**



7. An apparatus for dry polishing a flat face on a rock section comprising:

a. a support structure;

b. a circular planar table rotatably mounted on said support structure, said table having an upper surface with a center and outer edge;

c. drive meams mounted on said support structure and operatively connected to said table for rotating same; and

d. a polishing member mounted on the upper surface of said table and rotatable therewith for receiving a rock with a face to be polished in contact therewith;

e. means supported on said support structure outwardly of said planar table and having portions extending thereover for restricting area of movement of said rock whereby said rock is retained on the polishing member between the table center and outer edge and is free to rotate relative to said table and polishing member thereon; and

f. said polishing member being a mesh material having abrasive grit in particles adhered thereto with interstices therebetween for receiving dust removed from said rock being polished, said dust and said grit cooperating as said rock is progressively polished whereby the polishing operation is characterized by the cutting by said grit being coarse during initial stages and being gradually finer as said interstices receive and fill with said dust reducing exposure of the grit to provide a fine polishing member when said interstices are substantially filled.

4,043,082

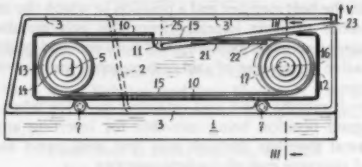
KNIFE SHARPENING MACHINE WITH AN ABRASIVE BELT

Enrico Ferroglio, Viale Catullo 12, I-10.090 Bardassano di Gassino, Italy

Filed Jan. 26, 1976, Ser. No. 652,313
Claims priority, application Italy, Mar. 21, 1975, 67707/75; Sept. 19, 1975, 69335/75
Int. Cl.[2] B24B *21/06;* **B24D** *17/00*
U.S. Cl. 51—135 R **12 Claims**

1. In a knife sharpening machine comprising a casing, two guide pulleys mounted for rotation on said casing, drive means for rotating at least one of said guide pulleys, an endless abrasive belt extending around said guide pulleys, tautening means for applying tension to said abrasive belt, said abrasive belt forming between said guide pulleys an operative linear run; the improvement comprising a guide slot for knives, of substantial length and defined by opposite rectilinear parallel side edges of said casing forming an acute angle with said operative run of the abrasive belt, said casing being substantially entirely closed

except for said guide slot, whereby in operation a knife to be sharpened is angularly guided by said slot against said operative run of the abrasive belt, and the abrasive belt yields elasti-

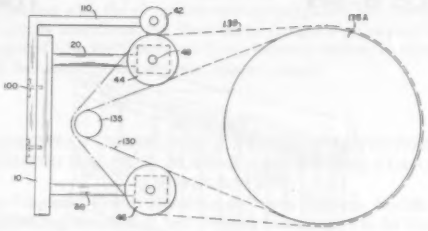


cally under the pressure exerted by the knife, spontaneously adapting itself to the profile of the knife in course of sharpening, thereby to reduce the danger of injury to a user of the machine and to reduce the escape of dust from the machine.

4,043,083
SANDING TOOL

Nicholas Paul Rosdil, 4550 Overlook Drive, NE., St. Petersburg, Fla. 33703

Continuation-in-part of Ser. No. 557,359, March 11, 1975, abandoned. This application Apr. 22, 1976, Ser. No. 679,223
Int. Cl.[2] B24B *23/06*
U.S. Cl. 51—170 EB **5 Claims**



1. An endless belt sander for sanding or polishing a workpiece comprising an external power source, a support structure, a single drive pulley mounted on said support structure and disposed in power receiving relationship to said external power source, a single idle pulley mounted on said support structure, an endless sanding or polishing belt having a length greater than the minimum length necessary to surround said drive pulley and said idle pulley, said belt being slack and extending only about said pulleys pressure pulley means attached to said support structure and established relative to said drive pulley to be in biasing engagement with that portion of said endless belt which is at any instant disposed in engaging relationship with said drive pulley to prevent slippage of said endless belt relative to said drive pulley, said endless belt disposed in looped-around relationship to the workpiece to provide sanding of the workpiece upon establishing tension on said endless belt by the position of said endless belt sander relative to the workpiece.

4,043,084
ULTRASONIC PERSPECTIVE CARVING

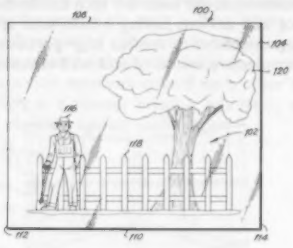
Arthur Kuris, 3725 Henry Hudson Parkway, Riverdale, N.Y. 10463

Filed Feb. 23, 1976, Ser. No. 660,412
Int. Cl.[2] B24B *1/00*
U.S. Cl. 51—318 **49 Claims**

1. The method of carving a design in an object with ultrasonic energy comprising:

A. providing cooperating tools each having a different working surface configuration for carving sections of the design on a surface of the object in partially overlapping relation to each other,

B. carving a first section of the design with one of said tools utilizing ultrasonic energy to a first depth, and

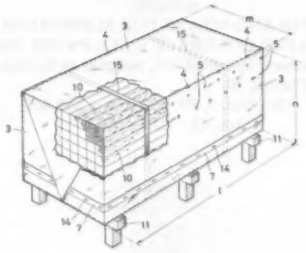


C. carving a second section of the design in partially overlapping relation to the first section with the other of said tools utilizing ultrasonic energy to a second depth different from said first depth, whereby the combined first and second carved sections creates a design of a single totality in perspective on the object.

4,043,085
LUMBER COVER

Fukuzo Ochiai, Okayama, Japan, assignor to Morishita Chemical Industry Co. Ltd., Japan

Filed July 2, 1976, Ser. No. 701,988
Claims priority, application Japan, Aug. 6, 1975, 50-109724
Int. Cl.[2] B62D *63/04;* **E04B** *1/12*
U.S. Cl. 52—3 **9 Claims**



1. A lumber cover for a stack of lumber comprising a cover structure consisting of a base sheet woven from polyolefin resin flat yarns as warps and wefts and a polyolefin film bonded to at least one face of said base sheet, said cover structure when mounted on the stack having a widthand length to cover the horizontal top and vertical sides of the stack, the vertical sides of said cover structure adapted to extend down from the top edges of the lumber stack and being provided with a number of air holes through the cover in at least one line disposed parallel to and below the top edge and means providing aligned nailing seats parallel to and below said air holes.

4,043,086
STRUCTURE FOR EXHIBITION PURPOSES

William P. Kaulfuss, Wilmette, and Robert H. Kaulfuss, Northbrook, both of Ill., assignors to Container Corporation of America, Chicago, Ill.

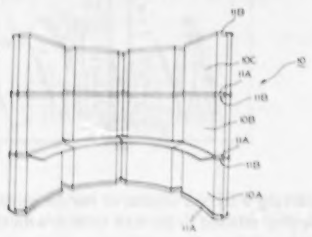
Filed Apr. 21, 1976, Ser. No. 679,003
Int. Cl.[2] E04B *1/346*
U.S. Cl. 52—71 **3 Claims**

1. In a module for erected wall elements for exhibition purposes wherein said wall elements are formed from a sheet of

light weight fibrous material capable of being folded along score lines therein and having spaced planar front, rear and end wall portions, the improvement in said module comprising:

a. upper and lower wall element confining devices arranged individually to support said wall elements and to surmount and undermount the same for such confinement;

b. each of said devices having a base with spaced flanges standing therefrom to confine edge portions of the front and rear planar portions of said wall elements;



c. each of said devices having certain spaced flanges at the ends thereof continuous with the first named flanges to receive the returns from said front wall portions for confinement of said return;

d. each of the ends of said devices being provided with a discontinuity in one of the spaced flanges thereof portion elements;

e. each of said discontinuous portions in said devices being constructed and arranged to accommodate extensions from said rear planar portions and portions of said returns in overlapping relation.

4,043,087

METHOD AND MEANS FOR SUPPORTING AN ELEVATED CONCRETE WALL PANEL FORM

Frank T. Connors, Deerfield, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Filed Dec. 8, 1975, Ser. No. 638,642
Int. Cl.² E04G 11/08
U.S. Cl. 52—127 9 Claims

1. In combination with a wall of an elevated concrete wall panel form, support means therefor which comprises:

a first concrete wall panel having an opening extending horizontally therethrough,

a bolt member removably inserted through said opening and projecting axially from opposite sides of said first wall panel and adapted for rotative movement about its axis,

said form wall being seated on one projecting end of said bolt member for use in forming a second concrete wall panel in superposed relation to said first wall panel, the opposite end of said bolt member being accessible, said form wall having a lower edge abutting on said one end of the bolt member for vertically removably seating the form wall thereon,

a retaining member captive on said one end of the bolt member, and

means mounting said retaining member on said bolt member for movement thereon between a position in which the retaining member is in substantial longitudinal alignment with the bolt member and a position in which the retaining member projects laterally from the bolt member, said retaining member being moved between said positions by rotative movement of said bolt member and gravitational force,

said bolt member and said retaining member when in said aligned position being movable for insertion and withdrawal together through said first wall panel and from said opposite end of the bolt member,

said retaining member being disposed in said laterally projecting position in spaced relation to said first wall panel and clamping said form wall therebetween,

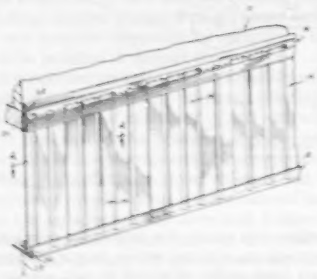
whereby said form wall may be vertically removed from its seat on said bolt member after forming said second wall panel and before withdrawing said bolt member, and thereafter said withdrawal of the bolt member may be effected.

4,043,088

TRAILER SKIRTING

Edward L. Payton, South Bend, Ind., assignor to Mastic Corporation, South Bend, Ind.

Filed Mar. 6, 1974, Ser. No. 448,523
Int. Cl.² E04C 2/32; E02D 27/00
U.S. Cl. 52—169.9 4 Claims



1. Skirting for a trailer statically supported upon a foundation and having a lower peripheral edge spaced above said foundation, said skirting including a plurality of vertically oriented panels each having parallel side edges and upper and lower marginal portions, an upper retainer means secured to said trailer lower edge, a lower retainer means secured to said foundation and located under said retainer means, said upper marginal portions of the panels anchored by said upper retainer means, said lower marginal portions of the panels anchored by said lower retainer means, the improvement wherein each panel has front and back faces and is formed of a flexible shape-retaining material, an accurate bend extending from one side edge of each panel, said bend being formed over said front face of the panel and terminating adjacent said front face in an outturned lip, said bend forming a part-circular channel in conjunction with said front face which extends the length of said one side edge of the panel, said lip defining a restricted opening into said channel at said front face, a flange extending from the other side edge of each panel, said flange projecting rearwardly of the panel and spacedly overlying the rear face thereof, said flange terminating in a return bent lip located between said flange and rear face, said return bent lip projecting at an acute angle to said flange, the flange of one said panel at the other side edge thereof overlying the front face of an adjacent panel at the one side edge thereof and extending through the channel opening and under the bend at said adjacent panel one side edge, the return bent lip of said one panel

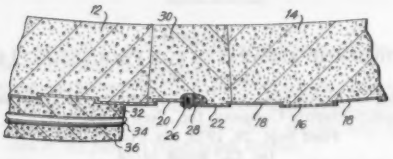
projecting forwardly of the front face of said adjacent panel and terminating within the channel and forwardly of the connection of the outturned lip to such channel of said adjacent panel to interlock said one panel and adjacent panel together against lateral separation.

4,043,089

OVERLAP CLOSURE SYSTEM FOR PRECAST PRESTRESSED WATER TANKS

Bill R. Bush, West Babylon, and Jack Hornstein, Old Bethpage, both of N.Y., assignors to Preload Company, Inc., Garden City, N.Y.

Filed Dec. 1, 1975, Ser. No. 636,729
Int. Cl.[2] E04D *1/00*; E04C *3/10*
U.S. Cl. 52—516 **3 Claims**



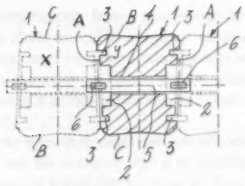
1. A prestressed concrete tank having a core wall comprising elongated panels of precast concrete assembled in spaced, side-by-side relationship, each of said panels having on its outer face a sheet of sheet metal presenting parallel longitudinal undercut channels and two, lateral, sheet metal flanges extending parallel with the elongated sides of said panels and laterally outwardly therefrom, the sheet metal flanges overlapping the flanges of adjacent panels and being fastened thereto to form a joint between the side-by-side, spaced panels.

4,043,090

ASSEMBLY OF PREFABRICATED ELEMENTS FOR FORMING WALLS OF PLANAR AND/OR NON-PLANAR CONFIGURATION

Ugo Viapiano, Centro Residenziale Parco Lambro, Stabile 6, 20090-Segrate (Milan), and Odoardo Andreoni, Via dei Gelsi, 10-20094 Corsico (Milan), both of Italy

Filed Sept. 26, 1975, Ser. No. 616,947
Int. Cl.[2] E04C *1/30, 2/06*
U.S. Cl. 52—583 **5 Claims**



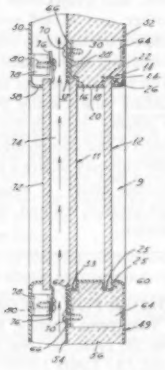
1. An assembly for making walls, comprising prefabricated elements, each of which is in the form of a prism having a substantially isosceles trapezoid cross- section, with each element having opposed parallel sides and opposed non-parallel sides, so that by approaching a plurality of said elements to one another at their non-parallel sides and by selecting the orientation of the trapezoidal cross-sections thereof, both planar and non-planar walls canbe provided, all of said elements being formed in said non-parallel sides thereof with recesses all of which are situated at the same elevation with pairs of said recesses adjoining each other at pairs of said non-parallel sides of said elements which are situated next to each other, and each of said adjoining pairs of recesses defining a space at a junction between adjoining elements where a pair of non-parallel sides thereof are situated, and each element being formed with a hole interconnecting and communicating with the recesses respectively situated at opposed non-parallel sides of each element, a plurality of connection members respectively extending with clearance through and beyond said holes into said recesses and forming pairs of adjoining connection members each having a pair of adjoining end regions situated in one of said spaces, and a plurality of pulling means respectively situated in said spaces with each pulling means operatively connected with a pair of adjoining end regions of a pair of adjoining connection members situated in each space for pulling said connection members toward each other and placing them in tension in a manner pressing adjoining, non-parallel sides of said elements against each other.

4,043,091

FLANGE MOUNT OVEN DOOR WINDOW

Joseph W. Katona, Walled Lake, Mich., assignor to Mills Products, Inc., Farmington, Mich.

Filed June 4, 1976, Ser. No. 693,082
Int. Cl.[2] F23M *7/00*
U.S. Cl. 52—616 **7 Claims**



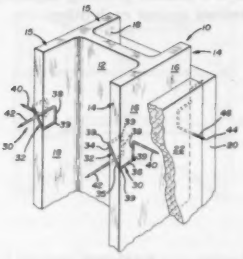
1. A self-contained flange mount window unit adapted to be assembled into an oven door having front and back door panels with aligned window openings, comprising a pair of glass panes, and retaining means for said panes comprising a substantially continuous frame-spacer extending along the top, bottom and side peripheral edge portions of said panes and holding the same in spaced parallel relation, said frame-spacer having a laterally outwardly projecting mounting flange by means of which said window unit may be mounted in the oven door, said frame-spacer including its flange being of unitary one-piece construction having a spacer portion engaging the inner peripheral surfaces of said panes and frame portions engaging the peripheral edges and outer peripheral surfaces of said panes, said mounting flange extending laterally outwardly from that part of one of said frame portions which engages the peripheral edge of one of said panes and being folded upon itself so as to extend laterally inwardly beyond the peripheral edge of said one pane to provide that part of said one frame portion which engages the outer peripheral surface of said one pane, and means engaging the folded portions of said mounting flange to mount the same to the oven door.

4,043,092

CLIP FOR ATTACHING INSULATION AND THE ASSEMBLY THEREOF

George W. Paul, Des Plaines; Henry A. Balinski, Hoffman Estates; Paul S. Quigg, Barrington, and John H. Crumbaugh, Des Plaines, all of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Oct. 2, 1973, Ser. No. 402,881
Int. Cl.[2] E04B *1/38*
U.S. Cl. 52—712 11 Claims



1. A unitary clip formed of a single piece of metal for attaching layers of preformed insulation to a structural member having a projecting edge, the clip comprising

a generally U-form edge gripping portion having a back portion and two legs extending therefrom,

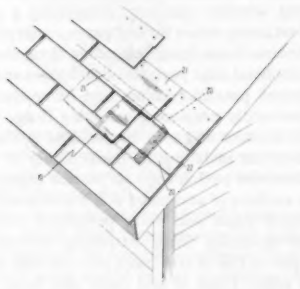
and two elongate pointed impaling projections operatively connected thereto, said projections being angled with respect to each other, one of said projections being doubled back with respect to the leg to which it is operatively connected and extending substantially parallel and oppositely directed with respect thereto, and the other of said projections extending substantially perpendicular to an imaginary plane passing through the leg to which it is operatively connected and completely to one side of said plane, whereby the clip may secure a plurality of sheets of preformed insulation about a structural member by gripping the edge thereof without the use of any additional fastening means.

4,043,093

ARTICLE HOLDER FOR A SLOPING ROOF

Louis C. Riggs, 1705 Youngland, Shively, Ky. 40216

Filed June 18, 1976, Ser. No. 697,459
Int. Cl.[2] E04D *15/00*
U.S. Cl. 52—749 12 Claims



1. A device for holding articles on a sloping roof comprising:

a. a holding portion having a structural configuration to contain said articles,

b. an attaching portion including an insertion section having a structural configuration effective to slide between successive courses of roofing shingles fixed to said roof,

c. said attaching portion including a bent end flange effective to hook downwardly over the top edge of the lower course of said successive courses of shingles when the insertion section is inserted therebetween, and

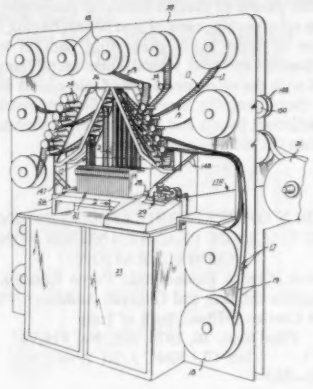
d. means for disengaging the bent end flange from said top edge to cause the insertion section to move away from said roof when the holding portion is pushed toward said roof.

4,043,094

METHOD AND APPARATUS FOR PROCESSING TAPED COMPONENTS

William D. Bohannon, Jr., Winston-Salem, N.C., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Sept. 29, 1975, Ser. No. 617,765
Int. Cl.[2] B65B *19/34*
U.S. Cl. 53—3 27 Claims



1. A method of processing taped components onto preselected center-to-center spacings, wherein leads of the components are joined in spaced relationship by interconnecting tapes secured to the leads, which comprise the steps of:

advancing the taped components along a preselected linear path;

cutting the interconnecting tapes between the leads of the taped components at a first position on the linear path;

engaging the leads of each of the taped components with a first cutting means which is linearly reciprocable along the linear path;

moving the first cutting means along the linear path to advance each of the taped components and cut portions of the tapes secured to the leads of the component further along the linear path away from the tape cutting first position and to move the leads of the component past a second cutting means at a second position on the linear path;

cutting the leads of each component to length from the cut portions of the tapes in the second position on the linear path by the first and second cutting means; and

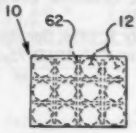
feeding each component from the second position on the linear path into a respective position on the preselected center-to-center spacings after the leads of the component have been cut to length from the cut portions of the tapes.

4,043,095

METHOD OF PACKAGING IN CARRIER WITH DROP DOWN PARTITION

Earl J. Graser, Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.

Division of Ser. No. 510,681, Sept. 30, 1974, Pat. No. 3,974,911.
This application Feb. 27, 1976, Ser. No. 661,909
Int. Cl.[2] B65B 5/06, 21/14
U.S. Cl. 53—26 2 Claims



1. A method of assembling twelve fragile articles into a carrier comprising the steps of

arranging the twelve articles into two separate groups of six articles in separate assembly lines wherein each group has two adjacent parallel rows of three articles with the articles in the parallel rows being abreast,

positioning respective dividers between the articles of the two groups in the separate assembly lines,

unfolding a carrier blank from a flat condition to an open condition, said carrier blank having an inside partition hinged to an inside top panel such that when the carrier is opened from a flat condition the partition drops under the force of gravity into a position extending sufficiently vertically to form separated portions within the carrier,

inserting the separate groups of six articles with dividers sideways simultaneously into respective opposite open ends of the carrier such that adjacent rows of articles in the respective groups of six articles abut the opposite sides of the partition, and

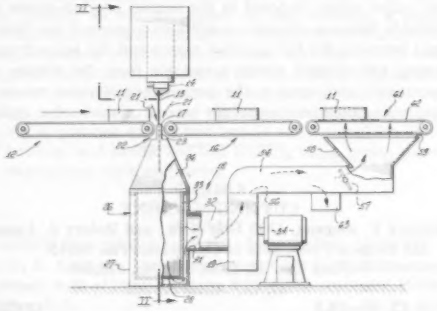
closing the open ends of the carrier to secure the articles in the carrier.

4,043,096

AUTOMATIC PACKAGING METHOD AND APPARATUS

Marvin E. Wallis, 20741 Horace St., Chatsworth, Calif. 91311

Filed Aug. 31, 1975, Ser. No. 285,140
Int. Cl.[2] B65B 7/16
U.S. Cl. 53—41 3 Claims



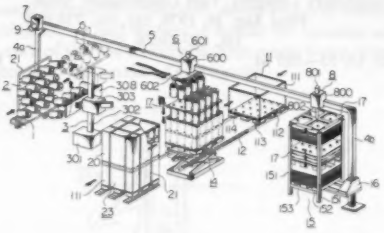
1. In a packaging process in which a molten sheet of resin material is extruded and projected from a film forming head through an opening in a conveyor and the articles to be packaged are conveyed so as to intercept such sheet above the opening and be at least partially wrapped thereby, the improvement in combination therewith comprising: the steps of developing a partial vacuum, while the molten sheet is extruded and projected, by the rapid withdrawal of air from beneath unsupported portions of said articles at a location aligned with said projected sheet as the articles intercept said sheet, to cause said sheet to wrap about and form a seal with each article, and breaking and trimming away excess film from said articles by said rapid withdrawal of air and carrying it away therein.

4,043,097

APPARATUS FOR PACKAGING A PLURALITY OF YARN PACKAGES IN A CARDBOARD BOX OR A LIKE CONTAINER

Kinyu Ishida, Takatsuki; Kenji Gose, Ashiya; Shigeo Matsunami, Matsuyama; Miyoyuki Sigeoka, Matsuyama, and Teruichi Matsumura, Matsuyama, all of Japan, assignors to Teijin Limited and Teijin Seiki Co., Ltd., both of Osaka, Japan

Filed Oct. 4, 1976, Ser. No. 729,293
Claims priority, application Japan, Oct. 3, 1975, 50-118934
Int. Cl.[2] B65B 5/08, 35/36, 57/00
U.S. Cl. 53—52 13 Claims



1. An apparatus for packaging a plurality of yarn packages in a cardboard box or a like container, comprising:

an over head guide rail disposed at a position above stations for carrying out the packaging operation;

a lift provided with means for supporting a plurality of yarn packages in upright condition and transporting said supported yarn packages to an uppermost predetermined position adjacently below said guide rail;

a pallet lifting device for displacing said cardboard box to a predetermined position for receiving said packages into said cardboard box;

a feeder capable of moving along said guide rail between a position right above said uppermost predetermined position of said lift and one of a plurality of predetermined position substantially above said pallet lifting device;

means for displacing said feeder along said guide rail;

means for displacing said cardboard box from said pallet lifting device;

means for sealing said cardboard box after completion of the transfer motion of cheeses from said feeder into said cardboard box and displacing said cardboard box from said pallet lifting device;

means for binding said sealed cardboard box;

said feeder being provided with members supporting said yarn packages in vertical condition, means for changing the arrangement of the supported yarn packages into a square lattice arrangement and means for displacing said supporting members to vertical direction;

whereby, yarn packages received by said lift are firstly displaced to said uppermost position of said lift and, then, said supporting members of said feeder are displaced downward to receive said yarn packages by means of said displacing means of said feeder, and after said supporting members completely receive said yarn packages from said lift, said feeder is displaced to one of said predetermined position right above a position of said cardboard box where said yarn packages are desired to be positioned, said means for changing the arrangement of the supported yarn packages is actuated so as to correctly arrange said supported yarn packages in a square lattice arrangement before releasing said supporting members from the respec-

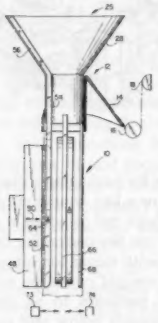
tive yarn packages and said pallet lifting device displaces said cardboard box upward to a predetermined uppermost position thereof, then, said displacing means of said feeder is actuated to displace siad supporting members toward said cardboard box, and thereafter, said supporting members are actuated to release these yarn packages, and after repeating the above-mentioned operations, if necessary, and when the space in said cardboard box is occupied by a predetermined number of yarn packages, said pallet lifting device is actuated to displace said cardboard box downward and, thereafter, the operations of said sealing means and binding means are carried out.

4,043,098

VERTICAL FORM, FILL AND SEAL PACKAGING MACHINE WITH IMPROVED BACK-UP BAR FOR LONGITUDINAL SEALING

Roger L. Putnam, Jr., East Longmeadow, and Edward F. O'Brien, Northampton, both of Mass., assignors to Package Machinery Company, East Longmeadow, Mass.

Filed Aug. 26, 1976, Ser. No. 718,072
Int. Cl.[2] B65B *9/12*
U.S. Cl. 53—180 M **11 Claims**



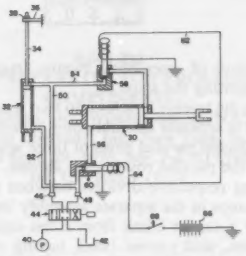
1. In a vertical form, fill and seal packaging machine, having a source of packaging material in the form of an elongated thin flat strip comprising successive package blanks as integral contiguous sections thereof, a tube former adapter to receive said strip material and progressively to form the same to a depending and upwardly open tubular configuration in passage therethrough, opposite longitudinal edge portions of the material being progressively juxtaposed by said former in overlapping and in parallel vertically extending relationship, a product dispensing means associated with said former and operable intermittently for the gravity discharge of measured quantities of product to the tube interior space through its said upwardly open end, a longitudinal seam sealing station disposed beneath said former, intermittently operable tube advancing means to draw said tube downwardly whereby successively to present intergral blanks in tubular form at said seam sealing station, an elongated seam sealing bar extending vertically at said sealing station adjacent a tubular blank at the station and intermittently movable generally horizontally toward and away from and into and out of sealing engagement with the overlapped edge portions of the blank, the improvement comprising an elongated back-up bar for said sealing bar extending vertically relative to the tubular blank at the sealing station adjacent said overlapped edge portions and in approximate horizontal registry with said sealing bar, a support member for said back-up bar, bar-up bar mounting means associated with said support member adapted pivotally to support said bar approximately at its mid point whereby to provide for free angular bar adjustment, precise parallelism, and uniform pressure distribution between and throughout the length of said sealing and back-up bar during each longitudinal seam sealing operation, at least one narrow elongated tube spreader fixedly supported within said tubular blank, and end sealing apparatus subadjacent said longitudinal sealing station and operable intermittently to seal transversely end portions of said tubular blanks whereby to form product bearing packages.

4,043,099

AGRICULTURAL IMPLEMENT HYDRAULIC SYSTEM

Leo George Cheatum, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed July 1, 1976, Ser. No. 701,839
Int. Cl.[2] A01D *75/22*
U.S. Cl. 56—10.9 **9 Claims**



1. In an agricultural machine having a mobile main frame connected to and towed by a tractor having a fluid pressure source, a reservoir and a first control valve means having first and second outlets and operative to control the flow of pressurized fluid between said outlets and the fluid pressure source and the reservoir, the machine having first and second shiftable elements and first and second hydraulic motor means respectively operative to control the position of said elements, the combination therewith of improved connecting means for connecting said motor means to the outlets comprising: a first hydraulic conduit means including first and second conduits respectively connecting the opposite ends of the first motor means to the first and second outlets respectively; a second hydraulic conduit means including third and fourth conduits respectively connecting the first and second conduits to the opposite sides of the second motor means so that the motor means are connectible in parallel to the outlets; a second control valve means disposed in the second conduit means and shiftable between alternate conditions to control the flow of fluid between the first conduit means and the second motor means; and control means actuatable from the tractor and operatively connected to the second control valve means for controlling the condition of the second control valve means.

4,043,100

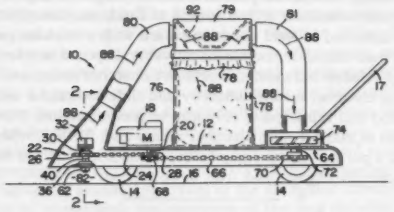
CUTTING MACHINE

Richard F. Aumann, 1390 Gulf Blvd., and Robert J. Aumann, 223 Dolphin Point, both of Clearwater, Fla. 33515

Filed Oct. 24, 1975, Ser. No. 625,690
Int. Cl.[2] A01D *55/262*
U.S. Cl. 56—16.5 **13 Claims**

1. A cutting machine for grass or like substance, said cutting machine comprising: a housing movably supported relative to a surface being cut, a cutting assembly mounted on said housing and includit.g prime mover means; said cutting assembly further comprising cutting blade means connected in driven relation to said prime mover means, said cutting blade means movably attached to said housing independent of said prime mover means so as to move relative to said housing in a non-rotational manner upon activation of said prime mover means, and bias means including a spring element interconnected

between said housing and said cutting blade means and disposed to normally bias said cutting blade means into original, non-operative position during activation of said prime mover means.

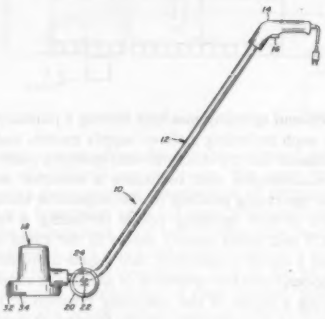


4,043,101

EDGER-TRIMMER HEAD INDEXING MECHANISM

Fred H. Lahr, Humboldt, and Roger W. Murley, Medina, both of Tenn., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 21, 1974, Ser. No. 434,869
Int. Cl.[2] A01G *3/06*
U.S. Cl. 56—17.1 3 Claims



1. In a combination grass trimmer and edger having a housing mounted for selective rotation about one end of an elongated handle, an electric motor in said housing, a shaft-mounted rotatable blade operatively connected to said motor, ground-engaging wheels mounted near said one end of said elongated handle, switch means in the other end of said handle, means for connecting said motor to a source of electric power through said switch means, the improvement comprising: notches in said one end of said handle and internal bosses in said housing, said handle and said housing being spring biased into engagement with each other.

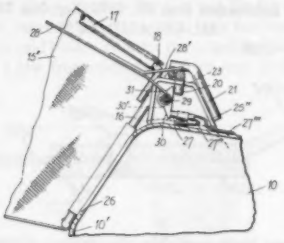
4,043,102

SAFETY FEATURES FOR REAR BAGGING MOWER

Charles E. Uhlinger, Des Moines, and Clair D. Splittstoesser, Ankeny, both of Iowa, assignors to AMF Incorporated, White Plains, N.Y.

Filed May 7, 1976, Ser. No. 684,027
Int. Cl.[2] A01D *35/26*
U.S. Cl. 56—17.4 9 Claims

1. In a rotary lawn mower having a deck, a grass cutting blade below said deck, power means on said deck for rotating said blade, a rear discharge opening in said deck, a rearwardly extending mower handle connected to said deck, and a removable grass catcher positioned behind said mower between said mower handle and opening to collect grass clippings expelled through said opening; improved safety means for said mower, said safety means comprising a door for said opening, means constantly biasing said door to closed position, means for locking said grass catcher on said mower, means for locking said door open after said grass catcher is first locked on said mower, and means for automatically turning said power means off in response to opening of said door unless said grass catcher is first positioned on said mower, a handle for opening said door, and each of said last mentioned three means being operable in response to movement of said handle.

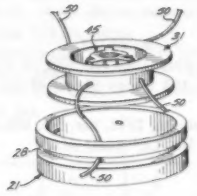


4,043,103

LAWN EDGER ACCESSORY

George W. Lakin, 14312 Harrington St., and Robert L. Lakin, 10592 Barbett, both of Garden Grove, Calif. 92643

Filed Mar. 15, 1976, Ser. No. 661,837
Int. Cl.[2] A01D *55/18*
U.S. Cl. 56—295 8 Claims



1. A rotary cutter assembly adapted for attachment to an arbor driven in rotation, comprising:

a circular spool adapted for mounting on said arbor and including a storage groove around the periphery thereof, a circular cavity concentrically disposed on the interior of said groove, and a plurality of openings disposed to radially communicate between said cavity and said storage groove;

a plurality of plastic filaments each terminating in one enlarged bulbous end, each said filament being conformed in section for receipt in said openings with said bulbous end disposed in said circular cavity; and

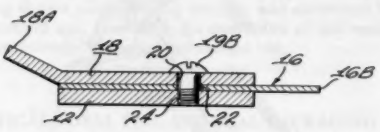
an annular retainer adapted for mounting on said arbor in concentric alignment around said spool including a stress relief groove formed on the exterior periphery thereof and a plurality of filament receiving bores communicating between said stress relieving groove and said spool for conveying said filaments from said spool to the exterior of said retainer.

4,043,104

MOWER BLADE ASSEMBLY FOR A LAWN MOWER

Kenneth R. Jones, Thiensville, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation of Ser. No. 600,781, July 31, 1975, abandoned.
This application Dec. 29, 1976, Ser. No. 755,155
Int. Cl.[2] A01D *55/18*
U.S. Cl. 56—295 6 Claims



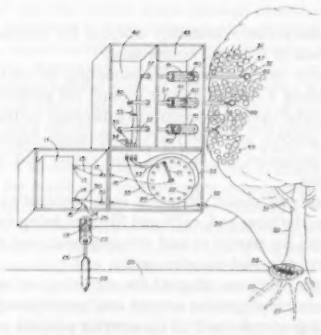
1. A mower blade assembly comprising a blade bar adapted to be rotated by the output shaft of a lawn mower, and a cutter blade subassembly secured to each of the opposite ends of said blade bar, each subassembly comprising a detachable thin metal cutter blade member made of a metal having a thickness no greater than about 0.0625 inch, said cutter blade member being provided with a plurality of cutting edges only one of which is in use in a given assembled position of said subassembly, said cutter blade member being orientable by reassembly of said subassembly to position any one of said cutting edges of said cutter blade member in cutting position, said cutter blade member being so positioned in said subassembly that the cutting edge of said cutter blade member which is in use in a given assembled position of said subassembly lies forwardly in a leading direction of the leading edge of said blade bar relative to the direction of rotation of said blade bar, and a detachable interchangeable propeller lift cap distinct from said cutter blade member and in retaining relation to said cutter blade member whereby said cutter blade member is sandwiched between said blade bar and said lift cap, said propeller lift cap including an upwardly bent body portion contiguous the trailing end of said lift cap relative to the direction of rotation of said blade bar, whereby to provide a lifting action on the grass, and means securing said cutter blade member and said lift cap in detachably assembled relation with respect to each other and with respect to said blade bar.

4,043,105

ELECTRO-PNEUMATIC FRUIT PICKER

Robert W. Cochran, 152 Bonny Shores Drive, Lakeland, Fla. 33801

Filed July 16, 1975, Ser. No. 596,504
Int. Cl.[2] A01D *46/24*
U.S. Cl. 56—328 R 11 Claims



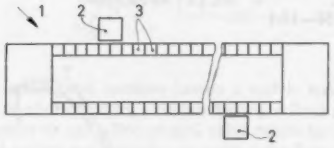
4. A fruit picker device of the type primarily intended for use in picking citrus fruit, said device comprising: boom means; pneumatic head means operatively attached to one end of said boom means for engaging said fruit; and electrical severing means operatively disposed in fruit-contacting relation on said head means whereby electricity may be directed through said fruit to remove said fruit from its stem, wherein said pneumatic head means comprises pressure chamber means disposed in fluid communication with a source of fluid; vacuum chamber means disposed in fluid communication with a vacuum pump; and at least one slide rod means movably disposed in interconnecting relation between said pressure chamber means and said vacuum chamber means, whereby said slide rod means may be extended and retracted in response to predetermined pressure changes in said pressure chamber means and, further, whereby at least a partial vacuum may be drawn on said slide rod means to graspingly engage said fruit to be picked.

4,043,106

OPEN-END SPINNING MACHINE WITH A TRAVELLING MAINTENANCE UNIT

Fritz Stahlecker, Bad Uberkingen, Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of Germany

Filed July 22, 1975, Ser. No. 598,071
Claims priority, application Germany, Aug. 8, 1974, 2438168
Int. Cl.[2] D01H *1/12, 13/16*
U.S. Cl. 57—34 R 18 Claims



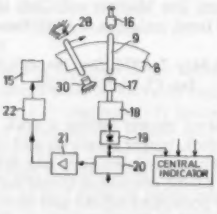
1. An open-end spinning machine having a plurality of spinning points each including a sliver supply means, and at least one maintenance unit travelling to said spinning points, said at least one maintenance unit including a detector means for detecting an operating position of the respective sliver supply means, each of said spinning points including a means for switching off said sliver supply means in the event of a malfunction and a signal transmitter, said signal transmitter being directly responsive to the operation of said sliver supply means and providing a signal of the operating position of the sliver supply means to the detector means located at said maintenance unit.

4,043,107

ARRANGEMENT FOR AUTOMATICALLY CONTROLLING THE TRAVEL SPEED OF YARNS, FILAMENTS, AND THE LIKE IN MACHINES PROCESSING THE SAME

Gerhard Günther, Muhlhausen, and Josef Stillig, Owen-Teck, both of Germany, assignors to Leuze-Electronic KG, Owen-Teck, Germany

Filed Apr. 1, 1975, Ser. No. 564,142
Int. Cl.[2] D01H *13/32*
U.S. Cl. 57—34 R 16 Claims



1. In an apparatus for processing yarns, filaments or other such elongated elements, an arrangement for controlling the

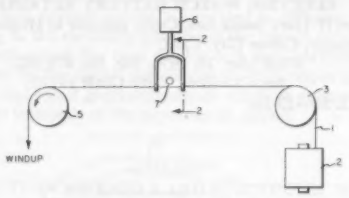
travel of such elongated elements, comprising, in combination, means for determining the number of element breakages occurring per unit time and for generating a corresponding breakage-frequency signal; means for establishing a reference breakage frequency; and means operative for automatically varying the speed of travel of the element as a function of the discrepancy between said reference breakage frequency and the breakage frequency indicated by said breakage-frequency signal, the apparatus being a ring spinning machine comprised of a winding spindle and a cooperating ring and ring traveller for guiding the elongated element onto a holding member mounted on the winding spindle, and wherein said means for determining the number of element breakages comprises means operative for monitoring travel of the elongated element indirectly by monitoring the operation of the ring traveller.

4,043,108

YARN PROCESS

Cecil Everett Reese, Kinston, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 16, 1976, Ser. No. 723,959
Int. Cl.[2] D02G *3/24;* D02J *1/06;* D01D *5/20*
U.S. Cl. 57—157 R **7 Claims**



1. In the process of producing spin-oriented polyester feed yarn for draw-texturing processes, the yarn treatment for providing a programmed distribution of deeper-dyeing sections along false-twist textured yarn resulting from draw-texturing the treated feed yarn; which comprises passing spin-oriented polyester yarn in a substantially undrawn condition past a source of heat and intermittently heating the yarn to provide a programmed distribution of heat-treated sections corresponding to the desired distribution of deeper-dyeing sections, said heating being sufficient for the heat-treated sections to have a force to draw value which is at least 1.12 times the force to draw of adjacent sections along the yarn and a density at least 0.005 gram per cubic centimeter greater than the density of the adjacent sections.

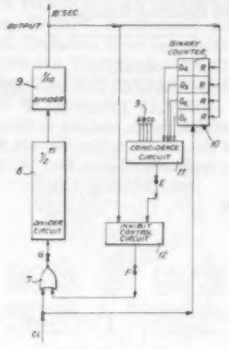
4,043,109

ELECTRONIC TIMEPIECE

Hitomi Numabe, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jan. 11, 1974, Ser. No. 432,719
Claims priority, application Japan, Jan. 11, 1973, 48-5532
Int. Cl.[2] G04C *3/00*
U.S. Cl. 58—23 R **9 Claims**

1. In an electronic wristwatch having a quartz crystal oscillator circuit adapted to oscillate at a predetermined frequency and produce a high frequency time standard signal, divider circuit means including a multi-stage divider chain for producing low frequency timekeeping signals in response to said high frequency time standard signal and means for the display of time in response to said timekeeping signals, the improvement which comprises said oscillator circuit including means for compensating for changes in temperature to render said high frequency time standard signal produced thereby substantially unaffected by temperature changes; and frequency regulating means coupled to said divider circuit means intermediate said oscillator circuit and divider circuit means for selectively regulating the frequency of said timekeeping signals by effecting continuous adjustment of said high frequency signal without changing the frequency at which said oscillator circuit oscillates, said divider frequency regulating means including inhibit means for inhibiting at least one period of said high frequency signal, said inhibit means including switch means for selecting a coincident count, said inhibit means further including a multi-bit binary counter having one bit for each setting switch means, means for applying said high frequency signal to be inhibited to said binary counter for counting thereby, means for applying a low frequency signal from said divider chain to



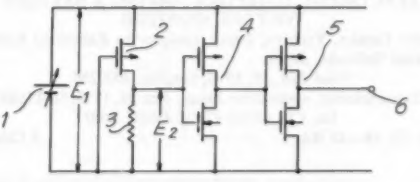
said binary counter for resetting same, coincident circuit means for receiving the output of said binary counter and the coincidence count from said setting switch means and in response to the coincident states thereof, producing an output pulse; and inhibit circuit means for receiving the output pulse of said coincident circuit means and the low frequency signal and in response thereto inhibiting the transmission to the next divider stage of a number of periods of the high frequency signal corresponding to said coincidence count.

4,043,110

ELECTRONIC TIMEPIECE BATTERY-POTENTIAL DETECTING CIRCUIT

Hiroyuki Chihara, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Sept. 2, 1975, Ser. No. 609,459
Claims priority, application Japan, Aug. 30, 1974, 49-99576
Int. Cl.[2] G04C *3/00;* G08B *21/00*
U.S. Cl. 58—23 BA **38 Claims**



1. In an electronic timepiece comprising oscillator means for producing a high frequency time standard signal, divider means for producing a low frequency timekeeping signal in response to said high frequency time standard signal, and display means for displaying time in response to the said timekeeping signal, the improvement comprising a DC power source for energizing said oscillator, divider and display means, said power source means being adapted to produce an effective voltage for such energizing, and electronic switching means for detecting the effective voltage produced by said power source means, said electronic switching means having a predetermined threshold voltage including a control electrode

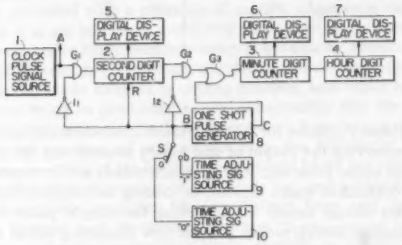
coupled to said power source for detecting the effective voltage thereof, and two further electrodes adapted to define a closed current circuit in response to said control electrode being referenced above a predetermined detecting voltage, said two further electrodes defining an open circuit in response to said control electrode detecting a drop in the effective potential of said power source below said predetermined detecting voltage, said control electrode being referenced to one of a voltage above and below said predetermined threshold voltage to define a current temperature coefficient of zero when the control electrode is referenced to a voltage above said predetermined detecting voltage.

4,043,111

INDICATED TIME-CORRECTING DEVICE OF DIGITAL DISPLAY TIMEPIECE

Minoru Fujita, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 10, 1975, Ser. No. 621,559
Claims priority, application Japan, Oct. 18, 1974, 49-119356
Int. Cl.[2] G04C *3/00*
U.S. Cl. 58—23 R **8 Claims**



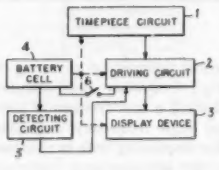
1. A digital display timepiece comprising a clock pulse signal source, counter means for counting the output pulses of said clock pulse signal source including a second counter, a minute counter and an hour counter connected in series, display means for digitally displaying the state of said counter means, and indicated time-correcting means for adjusting the state of said counter means including first means for disconnecting the output of said second counter from the input of said minute counter, second means for incrementing said minute counter, and selectively operable third means for simultaneously operating said first and second means.

4,043,112

ELECTRONIC TIMEPIECE HAVING A BATTERY VOLTAGE MONITOR

Kojiro Tanaka, Yachiyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Jan. 28, 1976, Ser. No. 653,256
Claims priority, application Japan, Jan. 29, 1975, 50-13109[U]
Int. Cl.[2] G04B *47/06;* **G04C** *3/00*
U.S. Cl. 58—23 BA **3 Claims**



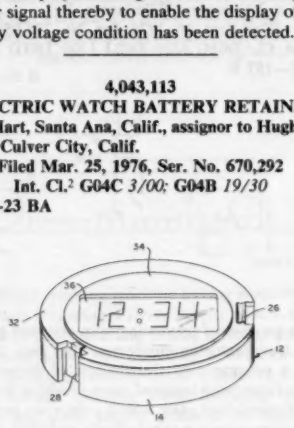
1. In an electronic timepiece of the type including a timepiece circuit for developing time signals representative of time; a driving circuit receptive of the time signals for developing display driving signals in response thereto; a time display receptive of the display driving signals for displaying, in response to the display driving signals, time represented by the time signals; and a battery for energizing the timepiece circuit, the driving circuit, and the display circuit; the improvement which comprises a battery voltage level monitor, for indicating when the voltage of the battery falls below a certain value, and which comprises: a voltage detector operative to detect the voltage of said battery and to develop a detector signal when the battery voltage is less than said certain value, a display restoring switch manually operable to ON and OFF conditions from an exterior of the timepiece, and wherein said driving circuit includes display signal control means responsive to the setting of said display restoring switch and the detector signal for interrupting the display driving signals applied to said display in response to the detector signal in order to de-energize said display and extinguish the time displayed to indicate that the battery voltage is below said certain level, and for applying said display driving signals to said display under control of said display restoring switch even in the presence of said detector signal thereby to enable the display of time after a low battery voltage condition has been detected.

4,043,113

ELECTRIC WATCH BATTERY RETAINER

William D. Hart, Santa Ana, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 25, 1976, Ser. No. 670,292
Int. Cl.[2] G04C *3/00;* **G04B** *19/30*
U.S. Cl. 58—23 BA **9 Claims**



1. An electric watch module, said module being comprised of a battery block having at least one battery opening therein, mounting means adjacent to said battery block for carrying horological electronics and for carrying a display for displaying horological information, the improvement comprising:

first and second hook recesses in said module for engagement with respect to said module; and

a battery retaining spring extending over said battery opening in said battery block and having first and second hooks thereon resiliently snapped into and engaged in said hook recesses for releasably resiliently holding a battery in said battery opening in said battery block.

4,043,114

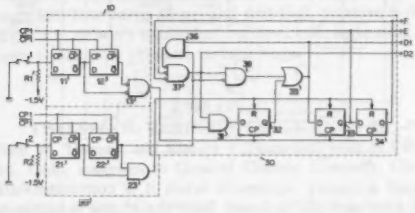
CIRCUITS FOR SETTING THE DISPLAY MODE AND THE CORRECTION MODE OF ELECTRONIC TIMEPIECES

Tsuneo Takase, and Tetsuo Yamaguchi, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 20, 1975, Ser. No. 633,833
Claims priority, application Japan, Nov. 21, 1974, 49-133132
Int. Cl.[2] G04B *11/24, 19/30, 27/00*
U.S. Cl. 58—23 R **8 Claims**

1. A circuit for setting the display mode and the correction mode of an electronic timepiece comprising first and second switches each having first and second switching positions; a first signal generating circuit which generates a pulse signal each time the first switch is set to the second position; a second signal generating circuit responsive to the switching positions

of the second switch for producing an output signal having binary logical levels at a first output terminal and for producing a pulse signal at a second output terminal each time the second switch is set to the first position; and a ring counter circuit comprising a plurality of serially connected shift registers which are driven by the pulse signal from the first signal generating circuit and cleared by the pulse signal from the second output terminal of the second signal generating circuit and a bypass circuit which is connected across at least one of



the serially connected shift registers and which is made nonactive depending on the binary level of the output signal from the first output terminal of the second signal generating circuit so that the ring counter circuit is operated in different modes according to the switching position of the second switch, and the control signals for time display and time correction are determined by the output signal from the first output terminal of the second signal generating circuit and from at least one of the output terminals of the ring counter circuit.

4,043,115

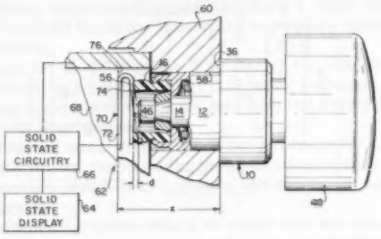
PUSH BUTTON ASSEMBLY AND ELECTRONIC WATCH INCLUDING THE SAME

Maurice Cyril Bryceland, Dover, N.J., assignor to Waldman Corporation, Parsippany, N.J.

Filed Sept. 29, 1975, Ser. No. 617,589

Int. Cl.[2] G04B *19/30;* **H01H** *3/12*

U.S. Cl. 58—50 R **14 Claims**



14. A digital watch comprising:

a. a metallic case having a display and an apertured wall;

b. a push button assembly including:

1. a metallic body mounted in the aperture in electrical contact with the case and having an axial bore colinear with the aperture;
2. a metallic stem slideable in the bore, the length of the stem being not less than the length of the body;
3. a spring member urging the stem rearwardly to a rear terminal position;
4. a head on the rearward end of the stem for selectively forwardly displacing the stem against the action of the spring member; and
5. an insulating locator sleeve mounted on the forward end of the body in coaxial relationship with the stem, the sleeve having a forward free end axially spaced forwardly of the forward end of the stem a fixed distance when the latter is in its rear terminal position, the forward end of the stem being positioned within the locator sleeve in said rear terminal position; and

c. a module within the case containing electronic circuitry for driving said display and having a yieldable conductor in resilient engagement with the forward free end of the locator sleeve of the push button assembly.

4,043,116

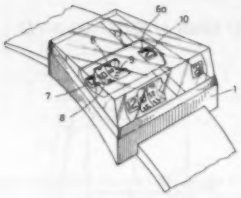
TIMEPIECE COMPRISING A FLAT DISPLAY DEVICE EXPOSED THROUGH AN OPENING IN A CASE

Hans Schläppi, Bettlach, Switzerland, assignor to Metallprodukte A.G. Grenchen, Grenchen, Switzerland

Filed Jan. 29, 1976, Ser. No. 653,367

Int. Cl.[2] G04B *19/06, 37/00, 39/00*

U.S. Cl. 58—88 R **8 Claims**



1. A timepiece comprising a case having an opening therein, an operating assembly disposed within said case, a flat display device exposed through said opening, and a crystal closing off said opening, wherein said crystal comprises two partially reflective surfaces enclosing between them an angle of less than 45°, and a third surface through which said display device is visible by means of a double reflection of light from said two partially reflective surfaces.

4,043,117

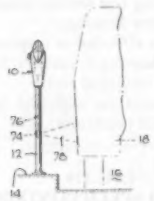
SELF-CANCELLING PARKING METER

Michele Maresca, Pasadena, and Thomas Ross Welch, Los Angeles, both of Calif., assignors to Michele Maresca, Pasadena and Thomas Ross Welch, Los Angeles, both of, Calif., part interest to each

Filed Oct. 8, 1975, Ser. No. 620,762

Int. Cl.[2] G07C *1/30;* **G08G** *1/14*

U.S. Cl. 58—142 **5 Claims**



1. A self-cancelling parking meter comprising:

a reset shaft in said meter;

a coin acceptor for advancing said reset shaft in accordance with the coinage received by said coin acceptor;

a timer connected through a reset clutch to said reset shaft, said timer being for returning said reset shaft at a timed rate;

reset means connected to open said reset clutch for resetting said reset shaft to its nonadvanced, zero position independently of said timer when the need for resetting is sensed, said reset means comprising a movable latch for maintaining said reset clutch engaged and including a spring for urging said reset clutch to a disengaged position when said latch is actuated to permit clutch disengagement;

a cam mounted on said reset shaft and a cam follower engag-

ing said cam, said clutch disengagement spring being stressed by said cam when said reset shaft is in an advanced position and being less stressed by said cam when said reset shaft is in its zero position; and

a clutch setting spring stressed by said cam follower to engage said reset clutch when said reset shaft is in its zero position.

4,043,118
PENDULUM DEVICE FOR BATTERY-POWERED CLOCKWORK MECHANISM

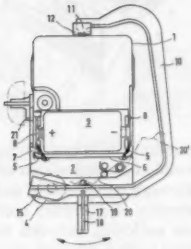
Albrecht Haag, Dauchingen, and Roland Siefert, Bad Durrheim, both of Germany, assignors to Kienzle Uhrenfabriken GmbH, Germany

Filed Nov. 6, 1975, Ser. No. 629,434

Claims priority, application Germany, Nov. 27, 1974, 7439474[U]

Int. Cl.[2] G04B *37/00, 17/00, 37/12*

U.S. Cl. 58—152 R **4 Claims**



1. An electrically operated clockwork mechanism having a pendulum comprising:

a first housing comprising a battery supporting means and time-keeping means energized by a battery,

a second housing detachably connected to said first housing and including a pendulum, a permanent magnet supported on the pendulum and a fixed electrical coil means,

said pendulum including a pendulum clip which is U-shaped and embraces within its open mouth the assembled combination of said first and second housings, with a first leg thereof supported pivotally adjacent one end thereof on an upper surface of said first housing and with the second leg thereof underlying said second housing which is positioned below said first housing,

and connecting means effective in response to the connection of said second housing to said first housing to connect said battery to said electrical coil,

said time-keeping means on said first housing operating independently of said pendulum.

4,043,119
ACCELERATION AND SPEED CONTROL CIRCUIT FOR JET ENGINE ACCESSORY EQUIPMENT

Dennis T. Faulkner, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 20, 1976, Ser. No. 660,198

Int. Cl.[2] F02C *7/26, 7/32*

U.S. Cl. 60—39.14 **21 Claims**

1. In a jet aircraft having at least one jet engine, a starter for starting the engines, and means for connecting the starter to the jet engine, a system for applying power to accessory equipment associated with a selected one of the jet engines from the starter comprising:

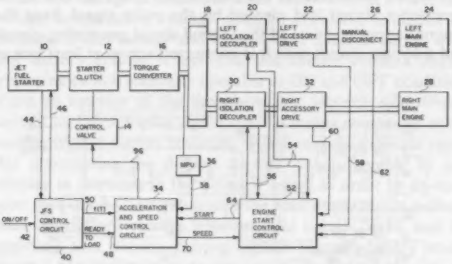
means for disconnecting the accessory equipment from the selected engine in order to permit the accessory equipment to operate independently of the selected engine;

means for controlling the starter;

means for connecting the starter to the accessory equipment;

means for measuring the speed of rotation of the accessory equipment;

means, responsive to said starter controlling means and said speed measuring means, for limiting the acceleration of



said accessory equipment when it is connected to the starter and disconnected from the engine wherein said acceleration limiting means includes an electronic circuit for generating a reference signal representing a predetermined rate of acceleration.

4,043,120
STARTING ARRANGEMENT FOR COMBINED AIR AND GAS TURBINE POWER PLANT

Hans Hoffeins, Viernheim, Germany, assignor to Brown Boveri-Sulzer Turbomaschinen AG, Zurich, Switzerland

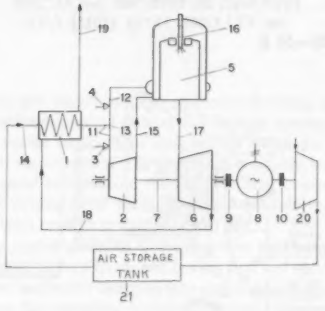
Continuation of Ser. No. 514,102, Oct. 11, 1974, abandoned.

This application May 28, 1976, Ser. No. 690,899

Claims priority, application Germany, Oct. 25, 1973, 2353493

Int. Cl.[2] F02C *7/26, 3/18*

U.S. Cl. 60—39.14 **1 Claim**



1. A gas turbine plant of the air storage type for generating electrical power to satisfy peak load demand comprising: high and low pressure stage turbines arranged on a common shaft; a compressed air storage tank, a compressor for supplying said storage tank with compressed air, a dynamo-electric machine selectively operable as a motor receiving power for driving said compressor and as a generator driven by said turbines for delivering power to satisfy peak load demand, a heat exchanger located in the flow path of the compressed air from said storage tank for heating said compressed air in advance of its delivery to said turbines, said heat exchanger being supplied with exhaust heat from the outlet from said low pressure stage turbine, first pipe means including a first valve means therein for connecting the air outlet from said heat exchanger to the high pressure stage turbine, a heating device for the compressed air interposed in the air flow path between the outlet from said high pressure stage turbine and the inlet to said low pressure stage turbine, second pipe means including a second valve means therein for connecting the air outlet from said heat

exchanger directly to the air inlet to said heating device, said first valve means being initially completely closed and said second valve means being initially completely open during a start-up of said plant whereby only said low pressure turbine stage is charged with compressed air flowing through the intially cold heat exchanger and said second valve means and thence through said heating device, and said first and second valve means being thereafter actuated to completely open and closed positions respectively after said heat exchanger has been heated to between 50 and 100% of its mean operating temperature whereby the compressed air now heated therein is passed through said first valve means and said high pressure turbine stage prior to delivery to said heating device for re-heating and delivery to said low pressure turbine stage.

4,043,121

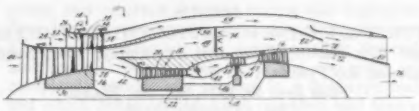
TWO-SPOOL VARIABLE CYCLE ENGINE

William W. Thomas, and Elmore V. Sprunger, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 538,167, Jan. 2, 1975, abandoned. This application Apr. 22, 1976, Ser. No. 679,097

Int. Cl.[2] F02K *3/06*

U.S. Cl. 60—204 **14 Claims**



1. A variable cycle gas turbofan engine comprising:

a core engine including a compressor, a combustor and a core turbine;

a stage or rotatable fan blades for pressurizing a motive fluid, a first portion of which enters said core engine and is discharged therefrom in a hot gas stream, and a second portion of which passes as a bypass stream through a first substantially annular duct generally surrounding said core engine;

auxiliary compression means comprising a radial extension of said fan blades for pressurizing an auxiliary motive fluid stream;

means for modulating the flow rate of the auxiliary fluid stream between a high flow rate during a subsonic operating mode and an essentially zero flow rate during a supersonic operating mode;

fan turbine means driven by said hot gas stream for rotationally driving both said fan blades and said auxiliary compression means in the subsonic and supersonic operating modes;

auxiliary combustion means to which fuel and the bypass stream are delivered for combustion therein during the supersonic operating mode; and

first variable area nozzle means for exhausting the hot gas stream.

4,043,122

FLUID CAM ASSEMBLY

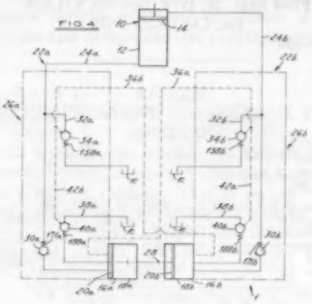
James T. Graham, Birmingham, Mich., assignor to Android International, Inc., Birmingham, Mich.

Filed Apr. 2, 1976, Ser. No. 673,289

Int. Cl.[2] F15B *13/09*

U.S. Cl. 60—375 **17 Claims**

1. Means for imparting alternating motion to a hydraulic motor assembly comprising a first hydraulic system for driving said motor assembly in one direction and a second hydraulic system for driving said motor assembly in the opposite direction, a reservoir for hydraulic fluid, each system having a pump assembly, each system having a suction line from said reservoir to its pump assembly, each system having a hydraulic pressure line from its pump assembly to said motor assembly, each system having a discharge line from said motor assembly to said reservoir, the pressure and discharge lines of one system communicating with one side of said motor assembly and the pressure and discharge lines of the other system communicating with the other side thereof, means for operating said pump assemblies alternately to deliver pressure fluid to one side of



said motor assembly and then to the other side thereof to drive said motor assembly in opposite directions, a valve in each suction line permitting flow only in a direction away from said reservoir, a normally closed valve in each discharge line, and means responsive to the build up of pressure in the pump assembly of each system for opening the valve in the discharge line of the other system.

4,043,123

NEGATIVE PRESSURE GENERATING SYSTEM FOR INTERNAL COMBUSTION ENGINE POWERED VEHICLES

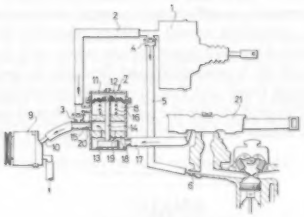
Hiromu Konishi, Toyota; Mitsuyuki Horie, Susono, and Tadahide Toda, Mishima, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1976, Ser. No. 688,536

Claims priority, application Japan, Dec. 9, 1975, 50-146702; Dec. 10, 1975, 50-146306; Dec. 19, 1975, 50-152154

Int. Cl.[2] F15B *3/00*

U.S. Cl. 60—397 **21 Claims**



1. A negative pressure generating system for an internal combustion engine powered vehicle, comprising:

a brake booster incorporated in the vehicle and adapted to cause an increase in braking power;

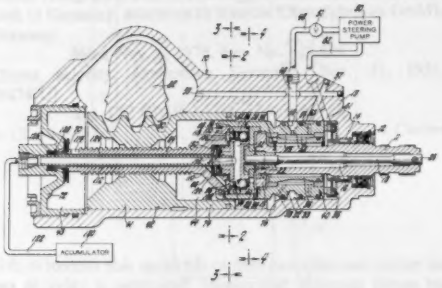
an air cleaner for cleaning air to be supplied to the internal combustion engine;

an air pump which receives air from said air cleaner and delivers the air to said internal combustion engine; and

a selector valve disposed among said brake booster, said air cleaner and said air pump and operative in response to a booster pressure in said brake booster on receiving said pressure as an input signal, thereby interrupting air communication between said air pump and said air cleaner,

with the result that the negative pressure arising on the suction side of said air pump is used as a negative pressure source for operating said brake booster.

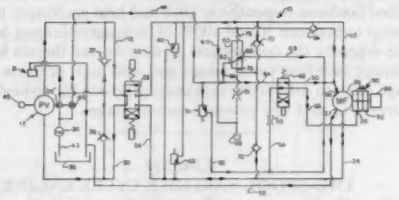
4,043,124
POWER STEERING GEAR
Thomas W. Weisgerber, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 29, 1976, Ser. No. 671,026
Int. Cl.[2] B62D *5/08*
U.S. Cl. 60—404 **5 Claims**



1. A power steering gear for a vehicle comprising a housing, rotatable input means rotatably mounted in said housing, output means rotatably mounted in said housing and extending outwardly therefrom, piston means mounted for sliding movement in said housing and drivingly connected to said output means for rotating said output means, threaded means drivingly connecting said input means to said piston means to permit said input means to move said piston means in said housing, said piston means dividing said housing into first and second fluid pressure chambers, a first source of fluid pressure, first valve means in said housing operatively connected to said first source of fluid pressure and actuated by said input means to selectively charge said first and second chambers to provide the hydraulically powered movement of said piston means and the resultant turning of said output means, exhaust passage means connecting said first valve means to said first source of fluid pressure, an auxiliary source of fluid pressure, second valve means in said housing and axially aligned with said first valve means drivingly connected to said first valve means for controlling the flow of pressure fluid from said auxiliary source to said fluid pressure chambers, said second valve means being hydraulically connected to said auxiliary source of fluid pressure and actuated by said input means when said first valve means is moved to a predetermined position in response to lowered pressure from said first source to selectively charge said chambers to provide for the auxiliary powered movement of said piston means and the resultant turning of said output means.

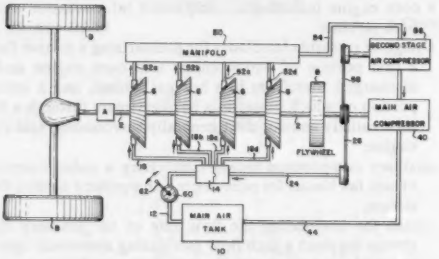
4,043,125
FLUID SYSTEM
Philip A. Kubik, 6809 Spruce Drive, Birmingham, Mich. 48010
Filed July 19, 1976, Ser. No. 706,584
Int. Cl.[2] F15B *20/00*
U.S. Cl. 60—406 **5 Claims**

1. A fluid system comprising:
a fluid pump having an outlet;
a fluid motor having an inlet;
a winch driven by said fluid motor;
conduit means fluidly connecting said pump outlet with said motor inlet, said winch having a pressure responsive brake normally set to brake said winch and prevent the same from operating, said brake being operable upon communication with a source of pressure to release said brake and permit said winch to operate;
a source of fluid pressure separate from said fluid pump;
a source of low-pressure fluid;
first valve means operable upon actuation to selectively connect said brake to either said source of fluid pressure or to said source of low-pressure fluid for selectively setting and releasing said brake; and



second valve means operable in response to a predetermined drop in the pressure of the fluid in said conduit means for connecting said source of fluid pressure to said source of low pressure whereby said brake is set irrespective of the position of said first valve means.

4,043,126
TURBINE ENGINE FOR AUTOMOTIVE VEHICLES
Jaime Rios Santos, Calle Jose H. Aldrey, 1442, Santiago Iglesias, Rio Piedras, P.R. 00921
Filed June 29, 1976, Ser. No. 700,810
Int. Cl.[2] F15B *13/07*
U.S. Cl. 60—407 **2 Claims**

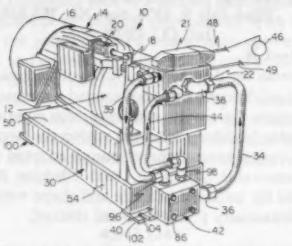


1. A turbine engine for an automotive vehicle, comprising a rotatable drive shaft, a plurality of turbine rotors mounted on the shaft, a main compressed air tank, a compressor driven by the drive shaft and connected to supply compressed air to the main air tank, a distributor valve, means for supplying compressed air from the main tank to the distributor valve, connections for transmitting compressed air from the distributor valve to the drive side of each rotor, means operated by the drive shaft for continuously operating the distributor valve to cause compressed air to flow to the rotors in sequence, a manifold, connections between the delivery side of each rotor and the manifold, and a connection for supplying second stage compressed air from the manifold to the main air compressor.

4,043,127
RESERVOIR HOUSING
Philip A. Kubik, 6809 Spruce Drive, Birmingham, Mich. 48010
Division of Ser. No. 592,414, July 2, 1975, Pat. No. 3,973,189.
This application Mar. 11, 1976, Ser. No. 666,084
Int. Cl.[2] F15B *15/18, 21/04*
U.S. Cl. 60—453 **1 Claim**

1. A hydrostatic drive unit of the type adapted to be connected in a closed-loop fashion to a fluid motor, said drive comprising:
a reservoir housing having an upper support surface;

a pump;
conduit means for connecting said pump to said motor in a closed-loop fashion;
fastening means for attaching said pump to said upper surface such that said housing supports said pump;
said reservoir housing having an enclosed chamber beneath said support surface, said chamber defining a reservoir for storing fluid at a low pressure;
means for communicating the fluid in said chamber to said closed-loop conduit means; and
a high-pressure filter for filtering fluid in said closed-loop conduit means as said fluid is returned to the inlet of said



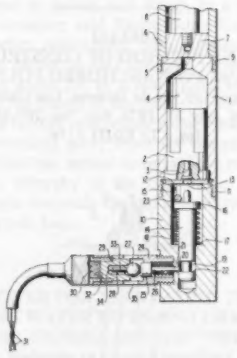
pump, said reservoir housing storing said high-pressure filter beneath said housing support surface; said housing having a lower surface that is connected to the ends of said upper surface by side walls and end walls which completely enclose said housing in a fluid-type manner and which define said enclosed chamber; said high-pressure filter comprising a filter housing and a filter element disposed therein, said housing of said fluid filter being disposed within said enclosed chamber, whereby said high-pressure filter is stored directly within said low-pressure fluid chamber and said filter element is not in direct fluid communication with said enclosed chamber.

4,043,128

COMPRESSED-GAS CARTRIDGE FOR FIRE PROTECTION PURPOSES

Hellmut Bendler, Stein, and Anton Bretfeld, Nurnberg, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed Feb. 27, 1976, Ser. No. 662,290
Claims priority, application Germany, Mar. 5, 1975, 2509496
Int. Cl.² F01B *29/08;* **F24F** *7/02;* **L05F** *15/20;* **F02N** *13/00*
U.S. Cl. 60—636 **29 Claims**



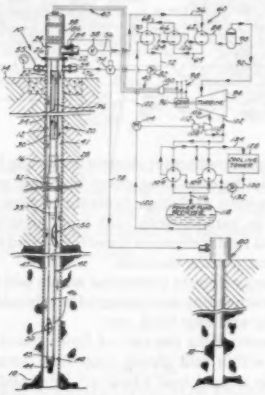
1. Apparatus for fire protection purposes comprising compressed-gas cartridge means having thermally responsive triggering means, said triggering means including striker means for forcibly being driven toward said compressed-gas cartridge means, locking means for maintaining said striker means at a spacing from said compressed-gas cartridge means, said locking means having a first end portion engaging a portion of said striker means for maintaining said striker means at the spaced position, first biasing means for biasing a second end portion of said locking means against a blocking means, said blocking means being disposed between said second end portion of said locking means and an abutment member, said blocking means being responsive to the exceeding of a predetermined temperature for enabling displacement of said locking means under the force of said first biasing means out of engagement with said striker means thereby permitting movement of said striker means toward said compressed-gas cartridge means.

4,043,129

HIGH TEMPERATURE GEOTHERMAL ENERGY SYSTEM

Barkman C. McCabe, Los Angeles, and Edward Zajac, Hollywood, both of Calif., assignors to Magma Energy, Inc., Los Angeles, Calif.

Filed May 5, 1976, Ser. No. 683,506
Int. Cl.² F03G *7/04*
U.S. Cl. 60—641 **90 Claims**



1. The method of obtaining energy from a well which provides access to an underground source of high temperature geothermal liquid, comprising the steps of:
introducing cooler liquid into said well,
establishing a column of said cooler liquid in the well above said high temperature liquid of sufficient height to prevent flashing of said high temperature liquid into vapor,
mixing said cooler liquid with said high temperature liquid in the well to produce a mixture having a temperature intermediate the temperatures of said high temperature liquid and said cooler liquid, and
conducting a stream of said mixture from the well.

4,043,130

TURBINE GENERATOR CYCLE FOR PROVISION OF HEAT TO AN EXTERNAL HEAT LOAD

Robert O. Brown, and Albert E. Becker, both of Media, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

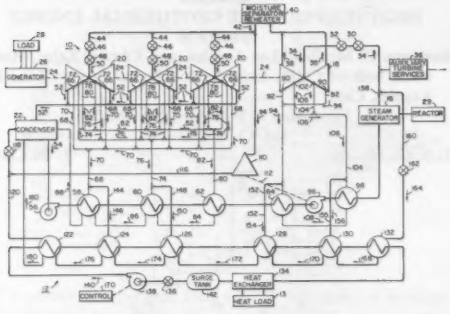
Continuation of Ser. No. 548,710, Feb. 10, 1975, abandoned. This application June 25, 1976, Ser. No. 699,771
Int. Cl.² F01K *23/02, 3/00*
U.S. Cl. 60—655 **8 Claims**

1. A steam turbine power plant comprising, in series, a steam generator element, a high pressure turbine element, a low pressure turbine element, a condenser element, a high pressure feedwater heater extracting steam from a predetermined location within said high pressure turbine element, a low pressure feedwater heater extracting steam from a predetermined loca-

tion within said low pressure turbine element, said steam extracted from said high pressure turbine having associated therewith a heating capacity different from the heating capacity of said steam extracted from said low pressure turbine element,

a closed loop flow arrangement disposed only in heat transfer relationship with said power plant to extract heat therefrom to supply a heat load, said flow arrangement confining and guiding a heat transfer medium therewithin,

a first and a second heater element connected within said flow arrangement, said first heater element extracting heat from said power plant by extracting steam from said predetermined location within said low pressure turbine element and disposed in parallel with said low pressure feedwater



heater, said second heater element extracting heat from said power plant by extracting steam from said predetermined location within said high pressure turbine element and disposed in parallel with said high pressure feedwater heater, said heater elements transferring said extracted heat to said heat transfer medium,

a heat exchange element connected within said flow arrangement for exchanging said extracted heat in said heat transfer medium to said heat load, and,

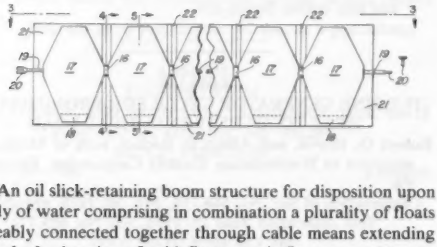
means for controlling the rate of flow of said heat transfer medium within said closed loop flow arrangement, the magnitude of said heat extracted from said power plant being directly controlled by said flow rate of said heat transfer medium.

4,043,131

OIL SLICK RETAINING BOOM FOR OFF-SHORE OIL WELLS

Byron J. Sessions, 4939 Havasu Way, Salt Lake City, Utah 84120

Filed Apr. 9, 1976, Ser. No. 675,253
Int. Cl.[2] E02B *15/04*
U.S. Cl. 61—1 F **8 Claims**



1. An oil slick-retaining boom structure for disposition upon a body of water comprising in combination a plurality of floats moveably connected together through cable means extending through the interior of said floats, each float comprising in combination:

an elongate water-tight housing for floating in a body of water;

weights attached to one end of said housing for retaining said weighted end downward in the body of water;

a pair of apertures disposed respectively on either lateral side of said housing through which said connecting cable means extends; and

sheet means interconnecting said floats to be held substantially perpendicular to the water surface said sheet means being constructed of metal and having hinged pleats disposed between adjacent floats to permit lateral movement of said sheet means.

4,043,132

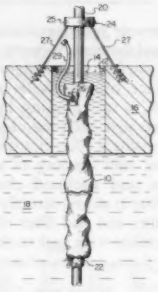
METHOD AND APPARATUS FOR PREVENTING FLUID SOLIDIFICATION IN AN APERTURE

Joseph E. Zupanick, Richardson, Tex., assignor to Sun Oil Company Limited, Toronto, Canada

Filed July 9, 1976, Ser. No. 703,865
Int. Cl.[2] E02B *9/02*
U.S. Cl. 61—1 R **13 Claims**

1. Apparatus for displacing a fluid within a cavity and preventing the solidification thereof around a removable structure disposed within the cavity, said apparatus comprising:

an inflatable bladder positioned within the cavity, said bladder having a passage therethrough adapted to encompass the removable structure, said bladder being further adapted for inflation to a size and shape within the cavity for substantially filling the void thereof;



means for inflating said bladder into a fluid displacement configuration to substantially displace fluid thereto disposed within the cavity;

means for retaining said bladder within the cavity for maintaining the fluid displacement configuration therethrough and preventing the formation of solidified fluid therein; and

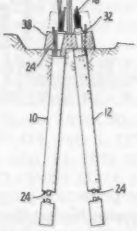
means for deflating said bladder within the cavity to permit the retrieval of said bladder therefrom.

4,043,133

STRUCTURE AND METHOD OF CONSTRUCTING AND TEST-LOADING PILE ANCHORED FOUNDATIONS

Lawrence R. Yegge, 139 Via de Tesoros, Los Gatos, Calif. 95030

Filed July 21, 1976, Ser. No. 707,184
Int. Cl.[2] E02D *5/74*
U.S. Cl. 61—50 **7 Claims**



1. A method of making a pre-tested anchored foundation structure in which the anchor members carry compressive

loads and resist upward loads including the steps of:

boring at least one pile hole into the sub-surface soil;

inserting into each pile hole a sheath containing one or more tendons, said tendons extending from the lower end of said sheath into the bottom end of said pile hole, and extending from the top end of said sheath above the surface of the soil;

forming a pile by pouring a concrete mixture into said hole to the exterior of said sheath, whereby the tendons extending from the lower end of said sheath become anchored to the bottom end of said pile but remain free for movement within said sheath;

mounting a tensioning jack to a jacking pad supported on the soil surface out of bearing engagement with the pile to position the jack in spaced relationship above the top of said pile, and connecting said jack to said tendons extending from the top end of said sheath; and

actuating said tensioning jack to apply a tension to said tendons, whereby said pile and its surrounding soil is pre-tested to withstand a measured force thus applied, and whereby the soil beneath the bottom surface of said jacking pad is loaded.

4,043,134

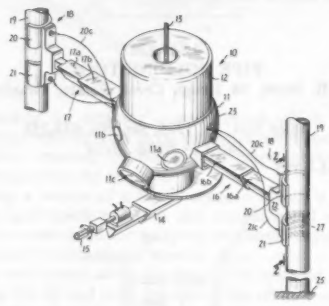
GUIDE ARM CLAMP MECHANISM FOR SUBMERGIBLE CHAMBER

Burton Hoster Mason, Box 54, Covington, La. 70433

Filed May 13, 1976, Ser. No. 686,088

Int. Cl.[2] B63C *11/40*

U.S. Cl. 61—69 R **16 Claims**



1. A guide arm clamp for a submergible chamber comprising a flange, means to mount said flange to a work arm of the submergible chamber, said flange being formed so as to be engageable, when submerged, with a submerged, positioned guide bar, and means on said flange to permit sliding engagement with the guide bar in a first mode, and means on said flange to hold the clamp to the guide bar to prevent sliding in a second mode further comprising roller means mounted to the flange and extending away from the flange surface so as to contact the guide bar, means to retract the roller means in the second mode, whereby in the first mode the roller means slidingly engages the guide bar and in a second mode the flange contacts the guide bar.

4,043,135

TRENCH CUTTER FOR EXCAVATING TRENCHES AND FOR LAYING WATER PIPES AND DRAINAGE PIPES

Klaus Gerd Hoes, Oberlethe, and Gerold Wöbken, Elsfleth, both of Germany, assignors to Firma Klaus-Gerd Hoes, Oldenburg, Germany

Filed June 3, 1976, Ser. No. 692,252

Claims priority, application Germany, Nov. 12, 1975, 2550735

Int. Cl.[2] E02F *5/10, 5/22*

U.S. Cl. 61—72.5 **4 Claims**

1. A trench cutter for excavating trenches and for laying water pipes and drainage pipes into the trenches, said cutter having an output drive shaft comprising:

a travelling cutter chain for digging an excavation;

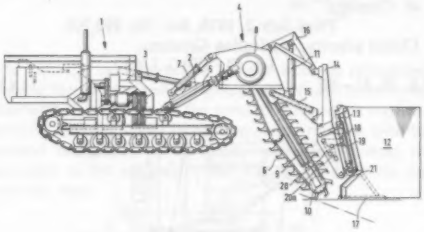
a jib supporting said cutter chain, said jib being pivotable in a vertical plane;

a pipe laying duct for entering the excavation, and sliding on the bottom of the excavated trench, said pipe laying duct being pivotably connected to the jib;

a duct guide arm extending parallel to the back surface of said pipe laying duct for supporting the pipe laying duct vertically so that it faces said cutter chain;

a plurality of parallel guide rockers having one end pivotably connected to said duct guide arm, said rockers being connected at their opposite end to said output drive shaft of the trench cutter, the drive shaft being pivotably connected to the free end of said jib; and

at least one work cylinder, and guide rod linkages connected thereto for adjusting the angle of inclination between the



cutter chain and the duct wherein a change of the clearance between said duct and cutter chain causes said duct to describe a curved path so that the lower edge of said duct is substantially tangential to the outer turning radius of the lower cutter chain.

4,043,136

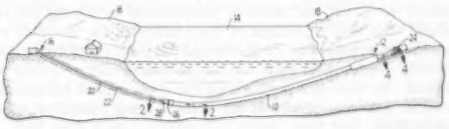
SYSTEM AND METHOD FOR INSTALLING PRODUCTION CASINGS

Martin D. Cherrington, Sacramento, Calif., assignor to Tidril Corporation, Sacramento, Calif.

Filed July 14, 1975, Ser. No. 595,830

Int. Cl.[2] F16L *1/02;* **E02D** *29/10*

U.S. Cl. 61—72.7 **14 Claims**



1. A method of emplacing a cylindrical casing beneath an obstacle along an underground inverted arcuate path between first and second ground level locations along the corresponding path of a pilot hole, said method comprising the steps of: placing a pilot string along an invert arcuate path under said obstacle; reaming an annulus about the pilot string with a reaming apparatus to a pre-selected diameter greater than the diameter of said casing, thereby to establish a reamed pilot hole including an annular void in the ground; introducing a casing behind said reamed pilot hole; providing a substantially sealing contact between the outside surface of said casing and the inside surface of said circumscribing ground of said reamed pilot hole at a location between the reaming site and the annular void; introducing a transport fluid at the reaming site; entraining the cuttings from said reaming step in the transport fluid; advancing said casing into and along said reamed pilot

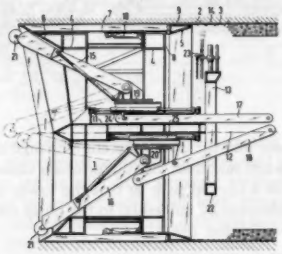
hole in following relation to said reaming apparatus along the inverted arcuate path; and impelling transport fluid and entrained cuttings into the leading portion of said casing and through said casing toward the trailing portion thereof to remove said transport fluid and entrained cuttings, whereby cuttings are prevented from settling in the case-circumscribing annular void between the outside surface of said casing and the inside surface of said circumscribing ground of said reamed pilot hole.

4,043,137

APPARATUS FOR AND A METHOD OF CONSTRUCTING A TUNNEL

Hans Jütte, Dortmund-Brechten; Siegmund H.F.L.M. Babendererde, Bad Vilbel; Adolf Foik, Munich, and Reinhard E. J. Bokemeyer, Offenbach, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia and Hochtief AG, Frankfurt, both of Germany

Filed July 2, 1975, Ser. No. 592,701
Claims priority, application Germany,
Int. Cl.[2] E01G *3/02*
U.S. Cl. 61—85 **14 Claims**



1. An apparatus for constructing a tunnel; said apparatus comprising a drive shield composed of a plurality of elongate cutter plank members arranged side-by-side in parallel configuration and forming a cylindrical array extending generally around the axis of the tunnel in contact with the tunnel wall, a frame for supporting and guiding the cutter plank members for longitudinal displacement, means for causing relative displacement between the frame and the members in the direction of the axis of the tunnel to effect driving of the tunnel a movable rear shield positioned rearwardly of said frame to support the tunnel wall rearwardly of the frame relative to the direction of tunnel driving and at a distance with respect to said frame, with sealing of said tunnel wall occurring behind the rear shield and wherein said cutter plank members of the drive shield have rear end portions peripherally overlying the rear shield such that regardless of the position of the movable rear shield with respect to the frame and the position of the longitudinally displaceable cutter plank members relative to said rear shield, the rear end portions of the drive shield peripherally overlie the rear shield at all times during operation of the apparatus.

4,043,138

OFFSHORE FOUNDATION STRUCTURE

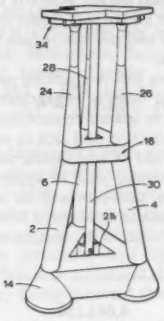
Jan Stageboe, Oslo, and Tomas Berge Einstabland, Asker, both of Norway, assignors to Ingenior F. Selmer A/S, Oslo, Norway

Filed Mar. 17, 1976, Ser. No. 667,923
Claims priority, application Norway, Mar. 21, 1975, 750982
Int. Cl.[2] E02B *17/00;* **F02D** *23/02*
U.S. Cl. 61—88 **9 Claims**

1. An open frame offshore foundation structure made of concrete to be firmly but removably located on a working site on the sea floor, comprising,

a lower set of bouyant but ballastable columns inclined towards each other in direction upwards and provided at their lower ends with laterally enlarged footings to be biased on the sea floor, said footings being rigidly interconnected with lateral stiffeners,

a bouyant but ballastable intertie box structure rigidly receiving the tops of said inclined columns, and comprising an integral unit of closed box girders, each having a width greater than the cross-section of the lower columns where they are connected to the intertie box structure, said intertie box structure defining a through-going opening in its center, and



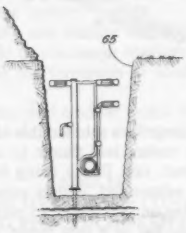
an upper vertical bouyant but ballastable column unit, the lower end of which is rigidly supported on said intertie box structure and the upper end of which is for supporting a working platform above sea level, the width of said closed box girders being greater then the cross-section of the columns of said column unit where they are connected to the intertie box structure.

4,043,139

PIPE HOLDING TOOL

Winfield B. Scott, 58 Rough Creek Estate, Granbury, Tex. 76048

Filed Nov. 19, 1975, Ser. No. 633,255
Int. Cl.[2] B63B *35/04*
U.S. Cl. 61—105 **6 Claims**



1. A pipe holding tool comprising:

an elongated tubular member,

a rod having a pointed end adapted to be inserted in the ground,

said rod being located in said tubular member with its pointed end extending out of one end of said tubular member,

said tubular member and said rod being movable relative to each other along their axes,

means for preventing said rod from extending out of the opposite end of said tubular member,

handle means connected to said opposite end of said tubular member,

means for securing said rod and said tubular member at a desired position relative to each other,

pipe supporting means carried by said tool and fixed in place relative to said tubular member,

said pipe supporting means being connected to said tubular member and extending sidewardly therefrom,

pipe locking means supported for movement, in a direction generally parallel with said axes of said rod and said tubular member, between a closed position and an open position,

said pipe locking means when in said closed position forming an enclosed or partially enclosed configuration with said pipe supporting means for holding a pipe in a position such that its axis is generally transverse with said axes of said rod and said tubular member,

said pipe locking means comprising rod means having an end extending to a position near but spaced from said handle means when said pipe locking means is in its closed position, and

a handle connected to said end of said rod means.

4,043,140

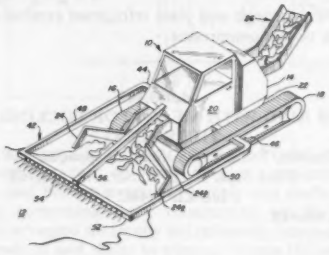
CRYOGENIC BEACH CLEANER

Robert F. Wendt, 2649 Mason St., Madison, Wis. 53705; Jan R. Acker, 4402 Dwight Drive, No. B, Madison, Wis. 53704, and Norman R. Braton, 457 Agnes Drive, Madison, Wis. 53711

Filed May 12, 1975, Ser. No. 576,687

Int. Cl.[2] F25C *1/00*

U.S. Cl. 62—66 **4 Claims**



1. A method for cleaning a sandy beach which has been contaminated with oil from an oil spill mixing with beach sand, by selective removal of the contaminated portions, said method comprising the steps of:

providing a source of a liquid cryogen which is movable along said beach and into said contaminated area, said source constructed for spraying said liquid cryogen onto the area forward of said source;

moving said source along the beach and into said area;

spraying the oil and sand mixture in the contaminated area forwardly of said movable source with said liquid cryogen for a length of time effective to solidify the mixture; and thereafter separating the solidified mixture from the beach.

4,043,141

AIR CONDITIONING METHOD AND APPARATUS WITH HUMIDIFIER

Hans Levy, and John Alan Schade, both of Cherry Hill, N.J., assignors to A. C. Manufacturing Company, Cherry Hill, N.J.

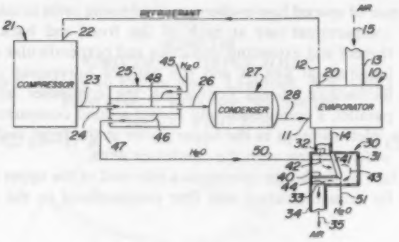
Filed Feb. 26, 1976, Ser. No. 661,722

Int. Cl.[2] F25D *17/06;* **F28C** *1/00;* **B01D** *47/00;* **C10T** *1/10*

U.S. Cl. 62—91 **7 Claims**

1. In an air conditioning system with humidifier including a refrigerant compressor, condenser and evaporator connected in fluid communication; the improvement comprising a humidifier having water inlet and discharge means and located in an air stream being conditioned to humidify the latter, a separate heat exchanger connected in fluid communication with and between said compressor and condenser downstream of the compressor and upstream of the condenser for passing hot refrigerant therebetween and having water passage means in heat receiving relation with hot refrigerant, water supply means connected to one end of said water passage means, and water conduit means connected between the other end of said water passage means and the inlet of said humidifier for passing heated water to said humidifier for enhanced humidification by removed heat.

5. In the method of air conditioning and humidifying the medium of a zone, the steps which comprise: evaporating a refrigerant in heat transferring relation with the medium of said zone to absorb the heat from the medium of said zone, pressuring the evaporated refrigerant out of heat transferring



relation with the medium of the zone to heat the refrigerant, condensing the pressurized refrigerant out of heat transferring relation with the medium of the zone to prepare for repeated evaporation, passing water in heat receiving relation with the pressurized refrigerant to heat the water, and passing the heated water to the medium of the zone to humidify the medium of the zone.

4,043,142

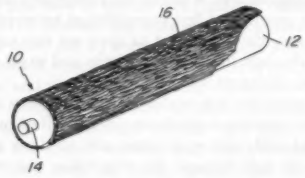
DAMPENING ROLL COVER

Preston F. Marshall, Walpole, Mass., assignor to The Kendall Company, Boston, Mass.

Filed Feb. 24, 1975, Ser. No. 552,514

Int. Cl.[2] D04B *1/00*

U.S. Cl. 66—170 **1 Claim**



1. An elastic dampening roll cover knitted in the form of a tubular sleeve comprising:

knitted courses and wales of inelastic absorbent yarn, said inelastic absorbent yarn comprising a substantially inelastic bulked yarn having a plurality of substantially continuous filaments which are individually convoluted into coils, crunodal loops and whorls at random intervals along their length and having a multiplicity of crunodal loops irregularly spaced along the yarn surface; said inelastic absorbent yarn is an air-bulked filament, core and effect yarn comprising nylon and rayon; and,

an elastic yarn interlaced with said courses and wales around the circumference of said tubular sleeve, said elastic yarn comprising an elastic core strand and an absorbent wrapping strand associated with said core strand in the form of doubled-back loops wound with false twist for a multiplicity of turns around the circumference of said elastic core strand.

4,043,143

LOCOMOTIVE ENVIRONMENTAL SYSTEM

Chester Henry Fluder, Wheeling, and Nick J. Yohanna, Chicago, both of Ill., assignors to Vapor Corporation, Chicago, Ill.

Filed Aug. 31, 1976, Ser. No. 719,200

Int. Cl.[2] B60H *3/04*

U.S. Cl. 62—243 **7 Claims**

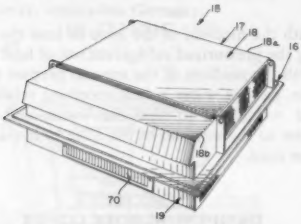
1. An air conditioning system for a locomotive cab to be mounted in the roof of the locomotive cab, said system com-

prising a frame including a centrally and horizontally arranged panel, upper and lower covers on the top and bottom sides of the panel defining upper and lower chambers, the upper chamber being generally positioned above the roof and exposed to the atmosphere, the lower chamber being generally positioned below the roof and within the cab, said upper chamber being divided into first and second side-by-side compartments,

a pair of spaced heat exchanger condensing units in said first compartment one at each of the front and back ends thereof and extending vertically and perpendicular to the longitudinal axis of and the path of movement of the locomotive, means connecting the condenser units in parallel, a compressor unit in said second compartment,

air inlet openings in the upper cover at the front and back walls aligning with the condenser units,

a first air discharge opening in a side wall of the upper cover for communicating said first compartment to the atmosphere and a second air discharge opening for said first compartment to connect same to said second compartment, a third air discharge opening in a side wall of the upper cover for communicating said second compartment to the atmosphere, whereby the compressor unit is cooled,



a blower unit in said first compartment between the spaced condenser units arranged to draw air into said compartment through the condenser units and expel air through said air discharge openings,

a heat exchanger evaporator unit in the lower chamber, an air inlet opening in the lower cover for the lower chamber aligned with said evaporator unit to allow air to move from the cab through the evaporator unit and into the lower chamber, air discharge opening means in the lower cover, and a blower in the lower chamber to draw air through the evaporator unit and expel it through the discharge opening means into the cab.

4,043,144

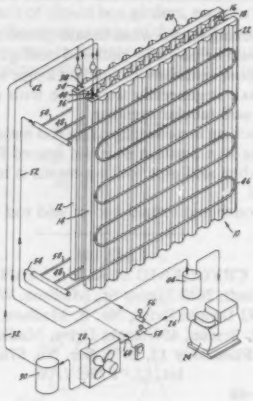
HOT GAS DEFROST SYSTEM

Michael C. Klotz, Chicago, and Viung C. Mei, Mount Prospect, both of Ill., assignors to Dole Refrigerating Company, Chicago, Ill.

Filed June 17, 1976, Ser. No. 696,886
Int. Cl.[2] F25B *47/00, 41/00;* F25D *11/04*
U.S. Cl. 62—277 **7 Claims**

1. In an eutectic plate refrigeration system, an eutectic plate, refrigerant conduit means within said plate and having an inlet and a discharge, a compressor connected to said discharge and a condenser connected to said inlet, a hot gas line connecting said compressor and condenser,

a defrost coil positioned exterior to said plate and having an inlet and a discharge connected, respectively, to the compressor and condenser sides of said hot gas line, valve means connected between said defrost coil inlet and the compressor side of said hot gas line, valve means connected in said hot gas line between the defrost coil inlet and discharge connections thereto, in one position of said valve means refrigerant from said compressor passing successively through said defrost coil, through said condenser, through said plate refrigerant conduit means and back to said compressor.

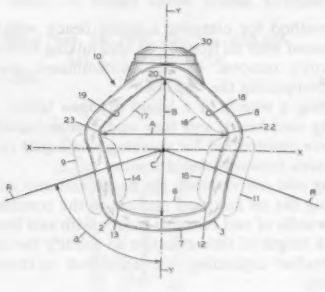


4,043,145

FINGER RING WITH MEANS FOR LOCKING BEHIND THE KNUCKLE

André Chervin, 7 Old Lyme Road, Chappaqua, N.Y. 10514

Filed Sept. 18, 1975, Ser. No. 614,765
Int. Cl.[2] A44C *9/00*
U.S. Cl. 63—15 **6 Claims**



1. A finger ring which locks on the finger and resists turning having a finger receiving aperture symmetrical with respect to the dorsal-palmar axis of the aperture and assymetrical with respect to the lateral axis, the dorsal-palmar axial dimension of the aperture accommodating the lateral dimension of the finger knuckle and being greater than the maximum lateral dimension of the aperture, said maximum lateral dimension accommodating the dorsal-palmar dimension of said finger knuckle, said aperture being bounded by five approximately equal length sides, said sides having surfaces which define the shape of said aperture and which comprise two straight to slightly outwardly curved dorsal surfaces which intersect in a central dorsal peak, each of said dorsal surfaces having a mid-portion, a laterally extending generally straight to slightly outwardly curved palmar surface, and a pair of inwardly curved side surfaces, said mid-portions, palmar surface, and side surfaces bearing against the corresponding surfaces of the finger when the ring is properly fitted thereon, said side and palmar surfaces intersecting in a pair of interior corners into which the palmar portion of the finger is adapted to be displaced as said

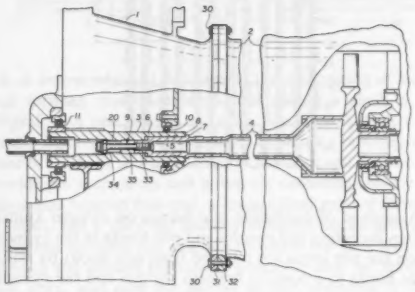
side and palmar surfaces bear against the palmar portion of the finger.

4,043,146

SHAFT COUPLING

Rudolf Stegherr, Guending, and Gerhard Ruecker, Karlsfeld, both of Germany, assignors to Motoren- und Turbinen-Union Muenchen GmbH M.A.N. Maybach Mercedes-Benz, Munich, Germany

Filed July 22, 1975, Ser. No. 598,043
Claims priority, application Germany, July 27, 1974, 2436270
Int. Cl.[2] F16D *3/24*
U.S. Cl. 64—1 V **7 Claims**



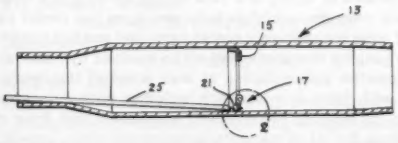
1. In an apparatus having first and second rigidly interconnected assemblies, each of which includes a respective rotatable shaft, and bearing means supporting said shafts, the improvement comprising force transmitting coupling means operatively arranged for rigidly but releasably interconnecting adjacent ends of said shafts to transmit torque therebetween, said bearing means comprising two bearings supporting one of said shafts at two axially spaced apart positions, said bearing means including a further bearing mounted to support the other of said shafts only at the end thereof away from said coupling means, wherein one of said shafts is hollow with a non-circular inner surface portion toward one end of the hollow shaft, and the other of said shafts has a correspondingly non-circular outer surface portion adapted for engaging the non-circular inner surface portion of said hollow shaft to positively interlock said shafts for rotation and torque transmission when the shafts are coupled, said hollow shaft further having an inner thrust threading (20) toward the other end of the hollow shaft for separating the coupling means.

4,043,147

INTERSHAFT BALANCE WEIGHT

David J. Wiebe, Palm Beach Gardens, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 15, 1976, Ser. No. 696,344
Int. Cl.[2] F16C *1/00*
U.S. Cl. 64—1 V **2 Claims**



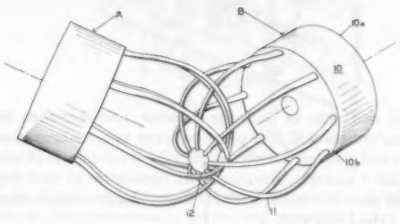
1. An intershaft balance weight for use on the low turbine shaft of a jet engine and the like, comprising, a hollow shaft having an open forward end, an anti-oval plug of annular configuration fixedly attached near the longitudinal center of the shaft and in contact with the inner surface thereof, said anti-oval plug including a right angled portion extending upwardly from one edge thereof, said inwardly extending right angled portion forming a wall inside said hollow turbine shaft, and means for attaching the balance weight to a predetermined position on said anti-oval plug through the open forward end of said hollow shaft without substantial disassembly of the jet engine thereby trim balancing the turbine shaft.

4,043,148

UNIVERSAL DRIVE JOINT

Philip B. Knapp, 40 Reyam Road, Lynbrook, N.Y. 11563

Filed Mar. 5, 1976, Ser. No. 664,195
Int. Cl.[2] F16D *3/26*
U.S. Cl. 64—17 R **4 Claims**



1. A universal joint comprising two intermeshed rotatable assemblies in driving and driven relationship with each other, each of said assemblies comprising:

a. a base having an axis of rotation, an attachment end, and an adjacent end, wherein said attachment end is adapted to be connected to a rotatable device; and

b. a plurality of yoke arms fixed at one end in said adjacent end of said base in spaced relationship to each other and said axis of rotation, said yoke arms being fixedly attached at their other end by a means of common joinder through the center of which the axis of rotation of said base passes, each of said yoke arms extending in a plane including the axis of rotation of said base and curving outwardly from said means of common joinder and thence inwardly toward said axis of rotation, said means of common joinder of each assembly being spaced from the means of common joinder of the other assembly and being intermediate the means common of joinder and the base of said other assembly to provide a bulbous cage-like structure loosely intermeshed with said other assembly.

4,043,149

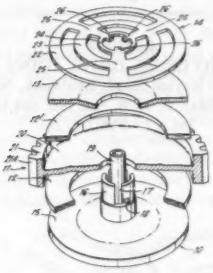
UNIFORM-LOAD CLUTCH DEVICE PARTICULARLY ADAPTED FOR APPLICATION IN MAGNETIC-TAPE RECORDERS

Domenico Tuninetti, Rome, Italy, assignor to SPEM: Societa Prodotti Elettronici Meccanici, Rome, Italy

Filed Jan. 8, 1976, Ser. No. 647,520
Claims priority, application Italy, Jan. 15, 1975, 47700/75
Int. Cl.[2] F16D *7/02*
U.S. Cl. 64—30 C **6 Claims**

1. A uniform load clutch device for transmitting a motion from a driving member to a driven member while permitting friction slippage between the two members should the driven member be stopped, wherein one of said members has a circular base and a first cylindrical part for receiving and guiding the other member, and there is provided first and second flat annular felt friction pads freely mounted on said first cylindrical part with said other member interposed therebetween and resilient biasing means mounted on said first cylindrical part for exerting a force to bring into firm engagement said members and friction pads, said first cylindrical part having a number of L-shaped slots, each slot comprising a long portion

parallel to the direction of the base axis and a short portion perpendicular thereto having a bayonet-joint indentation, said slots cooperating with matching locking means on said resilient biasing means to lock said resilient biasing means in operational position on said one member, so that the reaction thereof will



unload on said slots of said one member, and therefore no relative movement will take place between said resilient biasing means and said one member during the transmission of said motion, and a second cylindrical part concentric to said first cylindrical part of a lesser diameter and a longer length than said first cylindrical part.

4,043,150

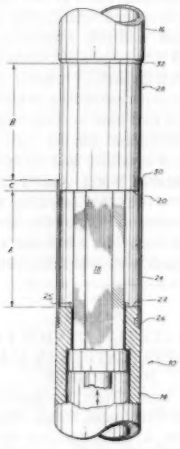
SAFETY SLEEVE

August B. Baumstimler, P.O. Box 832, Odessa, Tex. 79760

Filed Feb. 26, 1976, Ser. No. 661,691

Int. Cl.² F16D *3/84*

U.S. Cl. 64—32 R **5 Claims**



1. In a clean out well tool for removing debris from a well, said tool having

a. an elongated tubular body member,

b. a tubular head member,

c. said members slidingly telescoped together,

d. a body shoulder on the body member,

e. a head shoulder on the head member,

f. said shoulders coming together to form a stop to limit the sliding telescoping movement between the members;

g. THE IMPROVED SAFETY DEVICE COMPRISING IN COMBINATION WITH THE ABOVE:

h. a sleeve attached to one of said members,

i. holes in the sleeve,

j. said sleeve telescoped over the other member.

4,043,151

METHOD OF PRODUCING PILE OR PLUSH GOODS ON DOUBLE-BED CIRCULAR KNITTING MACHINES BY MEANS OF PLUSH HOOKS

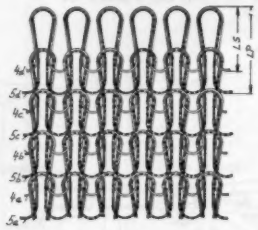
Walter Richared Schmidt, Breisach, Germany, assignor to Burlington AG, Switzerland

Filed May 14, 1974, Ser. No. 469,875

Claims priority, application Germany, May 23, 1973, 2326235; Mar. 25, 1974, 2414217

Int. Cl.² D04B *9/12*

U.S. Cl. 66—9 R **7 Claims**



1. A method of producing pile fabrics on circular knitting machines including dial needles and pile hooks in the cylinder, wherein the pile loops are released from said hooks by raising the pile hooks to a position beneath the dial and the cylinder, the improvement comprising maintaining said pile hooks in a raised first position, advancing the dial needles between the pile hooks, thereby preventing the stitches formed last from moving together with the needles, further advancing a first set of pile hooks to a raised second position, retracting a second set of pile hooks which are not selected for the formation of pile loops, feeding a pile yarn to the dial needles and the raised pile hooks and a base yarn to the dial needles, forming pile loops with the pile yarn by partially retracting the raised first set of pile hooks to position the pile yarn on the dial needles and holding the pile hooks in their partially retracted position after the knitting of the pile yarn as stitches or tuck stitches into the base yarn stitches until the dial needles are moved from a cast-off position into an idle position.

4,043,152

INLAY WHEEL AND METHOD

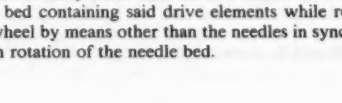
David J. J. Bryars, Leicester, England, assignor to Austen Bryars of London, Inc., United Kingdom

Filed Dec. 15, 1975, Ser. No. 640,945

Claims priority, application United Kingdom, May 3, 1975, 18622/75

Int. Cl.² D04B *9/16*

U.S. Cl. 66—9 R **3 Claims**



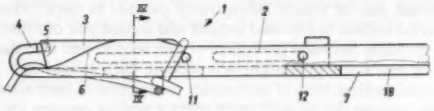
1. A method of laying in a yarn during knitting of a double knit fabric wherein said fabric is formed from fine denier yarn and said inlay is a relatively coarse yarn, said method comprising part gauging one needle bed of the machine by removal of certain needles and replacing at least some of the removed needles with drive elements each including butts corresponding with the butts on the removed needles but said drive elements being devoid of any knitting instrumentalities, providing at least one inlay wheel at one of a plurality of yarn feed stations on said machine, delivering the inlay yarn from a source of supply to the inlay wheel and hence to selected needles in the needle bed containing said drive elements while rotating the inlay wheel by means other than the needles in synchronization with rotation of the needle bed.

4,043,153

SLIDING LATCH NEEDLE

Heinz Lindner, Geyer, Erzg, and Dieter Happel, Karl-Marx-Stadt, both of Germany, assignors to VEB Wirkmaschinenbau Karl-Marx-Stadt, Karl-Marx-Stadt, Germany

Filed Aug. 7, 1975, Ser. No. 602,621
Claims priority, application Germany, Sept. 4, 1974, 4180887
Int. Cl.[2] D04B *35/06*
U.S. Cl. 66—120 5 Claims



1. A loop-controlled slide needle for the forming of loops in loop forming textile machines, comprising a shaft, a hook integral with one end of the shaft, the hook having a rearwardly tapered free end, the shaft forwardly tapering in the plane of the hook at the juncture of the shaft and the hook and providing a rearwardly and upwardly extending surface from below said tapered free end, a longitudinal groove formed in the shaft, and a slide bar slidably mounted in the groove for movement between one position in which the slide bar closes the hook and another position in which the slide bar leaves the hook open, said slide bar having an end extending from the bottom of the groove when positioned therein to above said tapered free end of said hook and which faces the rearwardly tapering free end of the hook and which has a hook receiving recess at the upper portion of its forwardly facing end for receiving the rearwardly tapered end of the hook when the hook is closed by the slide bar, said slide bar having at least one longitudinal slot therein, a pin fixed to the shaft and received in the slot for limiting the sliding of the slide bar in the groove, at least part of the length of the slide bar protruding above the groove, said slide bar, at a location remote from the end of the slide bar facing the tapered end of the hook, providing a loop receiving recess extending along its upper surface for receiving the last formed loop when the slide bar is retracted and the hook is therefore open, thereby to prevent premature closing of the hook by the slide bar, said slide bar comprising at least two flat-sided longitudinal members connected together with a flat side of each juxtaposed to a flat side of each other the respective forwardly facing ends of the members at the upper portions thereof nearer the hook being formed to diverge forwardly from each other thereby to define the recess in the slide bar and means are provided in the shaft above the slide bar for guiding the slide.

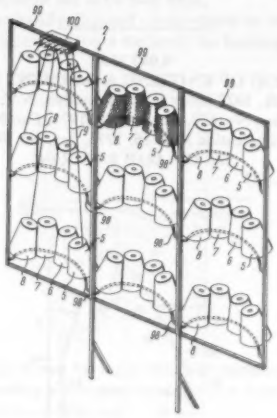
4,043,154

SPOOL RACK

Eberhard Merkle, Stuttgart, Germany, assignor to Wilh. Bleyle KG, Stuttgart, Germany

Filed Apr. 20, 1976, Ser. No. 678,677
Claims priority, application Germany, Aug. 7, 1974, 2438006
Int. Cl.[2] D04B *15/40*
U.S. Cl. 66—125 R 4 Claims

1. A spool frame for wound spools for transmission of thread to circular knitting machines comprising, an upstanding framework generally confined to a single plane subdivided into separated open section areas, each said open section area including a plurality of superposed semi-circular supporting elements the ends of which are finedly attached to said frame, a thread guide associated with the top thereof, and said semi-circular supporting elements provided with spool carrier means, each said spool carrier means being inclined inwardly of said semi-circular supporting elements and directed toward the thread guide means associated with the top of said section



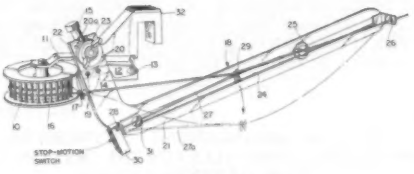
area and said thread guide means disposed substantially medially of said semi-circular supporting elements.

4,043,155

POSITIVE FEED DEVICE FOR KNITTING MACHINE

Robert Steinberg, Neponsit, N.Y., and Joseph Scotto di Carlo, Cornwells Heights, Pa., assignors to Scorpio Industries, Inc., Neponsit, N.Y.

Filed Sept. 27, 1976, Ser. No. 727,089
Int. Cl.[2] D04B *15/48, 35/14*
U.S. Cl. 66—132 T 6 Claims



1. In a knitting machine positive feed device of the type comprising a rotatable roller, a bracket adjacent said roller mounted for free pivotal movement through a limited arc about a pivot axis extending transverse to the axis of rotation of the roller, counterbalance means attached to said bracket and comprising a pair of weighted arms located on opposite sides of said pivot axis, at least one of said arms being of elongated configuration and oriented in a generally horizontal direction, said one of said arms having a pair of opposing ends one of which is a free end, and a pair of yarn guides disposed respectively adjacent the said opposing ends of said one of said arms for guiding a length of yarn from the running surface of said roller in the generally horizontal direction of extension of said one arm toward the said free end of said one arm and thence to a feeding station in said knitting machine, the improvement comprising further yarn guide means in engagement with said length of yarn at a position between said pair of yarn guides, said further yarn guide means comprising an elongated wire member one end of which engages said length of yarn and the other end of which is pivotably attached to said one of said arms, said elongated wire member extending in a generally horizontal direction from its point of pivotal attachment generally along the direction of extension of said one of said arms to its point of engagement with said length of yarn, the weight of said elongated wire member being operative, upon the occurrence of slack in said length of yarn due to overfeed of said

yarn by said roller, to effect free movement of said wire member about its point of pivotal attachment and relative to said pair of yarn guides under the influence of gravity for taking up said slack

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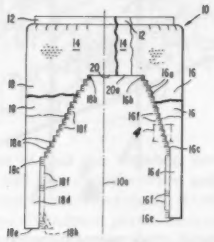
4,043,156

METHOD OF KNITTING A GARMENT BLANK

David Pernick, 1020 Shore Blvd., Brooklyn, N.Y. 11235

Division of Ser. No. 650,443, Jan. 19, 1976, Pat. No. 4,010,627.
This application Nov. 15, 1976, Ser. No. 741,762
Int. Cl.[2] A41B *9/02, 9/04*
U.S. Cl. 66—177 **4 Claims**



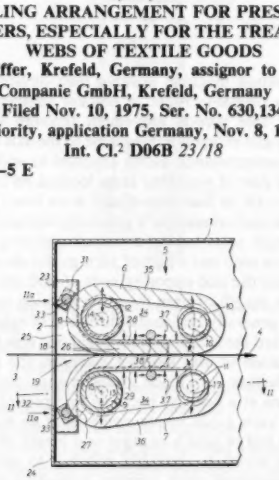
1. A method of knitting a garment blank by rotary knitting upon the circle of needles of a circular knitting machine including the steps of operating the circle of needles for rotary knitting of suitable yarn thereon to form wales and courses of a seamless, knitted tubular portion, for said blank, discontinuing knitting upon spaced groups of the needles, operating other spaced groups of needles of the circle of needles for rotary knitting of suitable yarn thereon thereby to form the wales and courses of spaced, seamless, knitted non-tubular first and second panels for the blank in continuation of the body portion, and cutting the last-named yarn after the knitting of each course of the panels, such yarn cutting resulting in each course of each of the panels being formed of an individual length of yarn during the knitting of the panels.

4,043,157

SEALING ARRANGEMENT FOR PRESSURE CONTAINERS, ESPECIALLY FOR THE TREATMENT OF WEBS OF TEXTILE GOODS

Günter Schiffer, Krefeld, Germany, assignor to Kleinewefers Industrie-Companie GmbH, Krefeld, Germany

Filed Nov. 10, 1975, Ser. No. 630,134
Claims priority, application Germany, Nov. 8, 1974, 2453059
Int. Cl.[2] D06B *23/18*
U.S. Cl. 68—5 E **10 Claims**



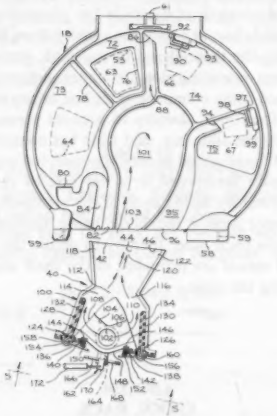
1. In combination with a container for treating webs of textile goods at above and below atmospheric pressure which is provided with an inlet opening and an outlet opening for respectively passing such webs through said inlet and outlet openings into and out of said container in a gas-tight manner, a pair of sealers including a first sealer and a second sealer respectively arranged at said inlet and outlet openings, each of said sealers comprising: a first pair of rollers each having an axis of rotation and arranged in spaced relationship to each other with the axes of rotation of said rollers substantially parallel to each other, a first endless belt looped around said first pair of rollers so as to define between said rollers a first and second straight belt section, a second pair of rollers each having an axis of rotation and arranged in spaced relationship to each other with the axes of rotation of the rollers of said second pair of rollers substantially parallel to each other, a second endless belt looped around said second pair of rollers so as to define between the rollers of said second pair of rollers a third and a fourth straight belt section, each of said first and second endless belts of each sealer having one of their straight belt sections define with each other a sealing passage for the web of textile goods to be passed therethrough on its way into and out of said container, driving means operatively connected with at least one roller of said first pair and second pair of rollers of said first and second sealer to establish synchronous movement of the belt sections which define the sealing passage of said first and second sealer respectively, at least one roller of each of said first pair of rollers being adjustable relatively toward and away from the rollers of said second pair of rollers, said first and second belts of each sealer sealingly engaging said container, said first and second pairs of rollers defining therebetween a space in which pressure remains effective.

4,043,158

LIQUID FLOW MECHANICAL DIVERTER VALVE

John Bochan, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed June 30, 1976, Ser. No. 701,215
Int. Cl.[2] D06F *39/02*
U.S. Cl. 68—17 R **11 Claims**



1. In a liquid flow mechanical diverter valve of the stream interaction type including a housing having an inlet for receiving a flow of liquid from a liquid source, a pair of first channels communicating with the inlet, said channels each having an exit port, an interaction chamber in the valve housing, a pair of converging second channels between the exit ports of the first channels and the interaction chamber, three exit areas directed away from the interaction chamber, means associated with the ports of the first channels for effecting opening and closing thereof at predetermined times for controlling the flow of liquid therethrough, the improvement comprising:

the diverter valve having two flapper assemblies each having a first portion large enough to seat against and cover a first channel exit port, a second portion at an angle to the

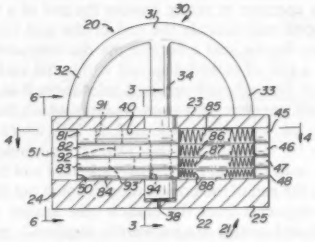
first portion and rigidly secured thereto, a pivot at the junction of the first and second portions, the second portions being spaced from and directed toward each other, a spring associated with the second portion to urge the second portion away from the valve housing a sufficient distance to have the first portion seated against the first channel exit port, said spring having a force insufficient to prevent the flow of liquid through the exit port, a pivotal arm assembly having a pivot, two tangs radially outward of the pivot and a mechanical push-pull actuator secured to the arm assembly to pivot the arm assembly to three positions, only two of said positions selectively register one of the tangs with one of the second portions to act as a stop to retain the first portion seated against the exit port during a predetermined period of time of liquid flow through the inlet.

4,043,159

PADLOCK CONSTRUCTION

Joseph J. Malacheski, 28 E. Division St., and Richard J. Zenda, 21 O'Neill Ave., both of Wilkes-Barre, Pa. 18702

Filed Nov. 5, 1976, Ser. No. 739,068
Int. Cl.[2] E05B *67/22*
U.S. Cl. 70—38 R **9 Claims**



1. A padlock comprising a body having at least a pair of generally parallel tine-receiving holes, a shackle having at least a pair of generally parallel tines inserted in said holes and shiftable therein between shackle locked and unlocked positions, a plurality of spring biased tumbler pins shiftable in said body transversely intersecting one of said tines to retain the latter in its shackle locked position, said tumblers having notches at selected locations to release said one tine for shifting to its shackle unlocked position upon alignment of the tumbler notches, said body having a key slot for end access to said tumblers to shift the latter and effect said alignment, and a keeper mounted in said body extending between said holes and into said tines to positively retain the latter in said shackle locked position against tampering, said keeper being movably mounted in said body, and coacting tine and keeper surfaces simultaneously urging the keeper on one side and providing clearance on the other side to move the keeper and release said tines to shackle unlocked position.

4,043,160

INTERNAL TOOLING FOR SWAGING APPARATUS

Charles Marvin Baker, Kirkland, and Gene Bruce Foster, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 18, 1975, Ser. No. 641,956
Int. Cl.[2] B21D *22/10*
U.S. Cl. 72—61 **11 Claims**

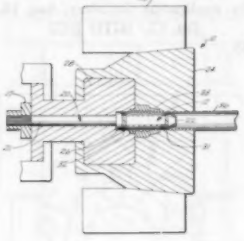
1. Internal tooling for a swaging apparatus comprising:

a draw bolt having a shank and an enlarged coaxial head located at one end of the shank,

a shoulder extension on the end surface of the head facing the shank, said shoulder defining a seat extending a predetermined distance from the draw bolt head axially of the shank,

a sleeve of a resilient material coaxially disposed on the shank adjacent the draw bolt head,

a bushing coaxially disposed on the shank on the side of the resilient sleeve opposite the head, the bushing end surface



facing the sleeve having a shoulder extension defining a seat extending a predetermined distance from the bushing axially of the shank, and

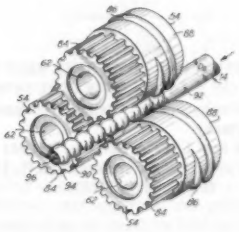
a pair of radially expandable anti-extrusion rings disposed in and axially overlapping the seats in the head and bushing respectively and abutting the respective adjacent ends of the sleeve.

4,043,161

APPARATUS FOR FORMING CORRUGATIONS OF "ZERO" PITCH IN COAXIAL CABLE

Joseph R. Toma, Colonia, and Oliver C. Johnson, Irvington, both of N.J., assignors to Astrolab, Inc., Linden, N.J.

Filed Nov. 7, 1975, Ser. No. 630,035
Int. Cl.[2] B21J *15/12;* **B21D** *15/06*
U.S. Cl. 72—78 **10 Claims**



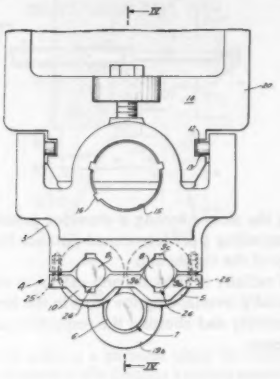
1. An apparatus for forming parallel corrugations in a circular member comprising a head, means including a takeup drum for pulling the circular member through the head, drive means for rotating the head and the takeup drum, said head including a plurality of forming dies mounted for rotation relative to said circular member, each of said forming dies including a single turn helical die thread adapted to indent said circular member, means for synchronizing movement of said forming dies in unison about said circular member, said takeup drum pulling said member through said head such that the linear displacement of the circular member through the head is substantially equal to the linear displacement of the helical thread relative to said circular member thereby enabling said forming dies to form parallel corrugations in said circular member.

4,043,162

ROLLER ASSEMBLY FOR SHEET-BENDING HEAD AND METHOD OF MAKING ROLLER BEARINGS THEREFOR

Oskar Noé, Mulheim (Ruhr), and Wolfgang Skrober, Moers, both of Germany, assignors to BWG Bergwerk- und Walzwerk-Maschinenbau G.m.b.H., Duisburg, Germany

Filed Aug. 13, 1976, Ser. No. 714,277
Claims priority, application Germany, Aug. 16, 1975, 2536582
Int. Cl.[2] B21D *1/02*
U.S. Cl. 72—163 10 Claims



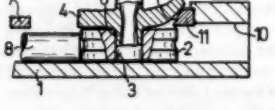
1. A bending head for stretching a tensioned sheet-metal strip, comprising:
an elongate deflecting roller extending across a path of a strip to be stretched;
two sets of back-up rollers, shorter and heavier than said deflecting roller, contacting said deflecting roller at locations remote from said path, the back-up rollers of each set being aligned along a common axis parallel to the deflecting-roller axis and being each provided with a pair of stub shafts on opposite ends; and
a frame forming journals for the extremities of said deflecting roller and bearings for said back-up rollers, said bearings including members provided with notches diverging toward said path, said stub shafts being cradled in said notches.

4,043,163

DEVICE FOR REMOVING THE PRESS REST FROM THE FRONT SIDE OF A DISC FOR EXTRUDING TUBES

Richard Raab, Rothenbach, Peg., Germany, assignor to DIEHL, Nuremberg, Germany

Filed Feb. 6, 1976, Ser. No. 655,941
Claims priority, application Germany, Feb. 7, 1975, 2505160
Int. Cl.[2] B21C *35/00*
U.S. Cl. 72—255 2 Claims



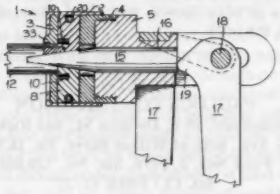
1. A device for removing the press rest from the front side of a press disc for extruding tubes, which press disc also has a substantially plane rear surface opposite said front side, said device comprising in combination supporting means having a supporting surface for supporting the disc, also comprising separating means having a separating surface defining with said supporting surface an angle for lifing the press rest from the press disc, and a framework providing a passage for the disc, said separating surface being provided on said framework adjacent said passage.

4,043,164

BRANCH TOOL

Anthony Haldane Ray Brookman, Wattle Park, Australia, assignor to Rast Patent Manufacturers Pty. Ltd., North Plympton, Australia

Filed June 9, 1976, Ser. No. 694,478
Claims priority, application Australia, June 18, 1975, 2025/75
Int. Cl.[2] B21D *19/00, 39/08*
U.S. Cl. 72—332 5 Claims



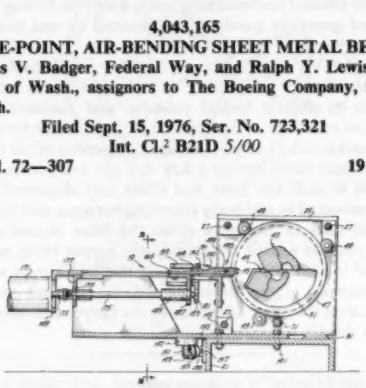
1. A tool for shaping the end of a branch tube which is to be engaged in a socket in the side of a main tube, comprises a die having an aperture to neatly receive the end of a branch tube to be shaped and encircle the end of the said tube when inserted into the die, and a bore in the die intersecting the said aperture, a pair of cutters disposed within the said bore in the said die on diametrically opposed sides thereof and extending into the said aperture, slits in each cutter which face the opening of the said aperture in the said die into which the branch tube may be inserted, the slits having their outer walls coextensive with the walls of the said aperture and being shaped to engage the end of the branch tube to notch out diametrically opposed segments from the branch tube against the said die when the said cutters are outwardly displaced, means to displace the said cutters outwardly, and means to return the said cutters after displacement.

4,043,165

THREE-POINT, AIR-BENDING SHEET METAL BENDER

Douglas V. Badger, Federal Way, and Ralph Y. Lewis, Kent, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sept. 15, 1976, Ser. No. 723,321
Int. Cl.[2] B21D *5/00*
U.S. Cl. 72—307 19 Claims



1. A three-point, air-bending sheet metal bender comprising:
a first elongate, U-shaped finger die, one leg of said U-shape forming a finger region and the aperture of said U-shape forming a palm region;
a second elongate, U-shaped finger die, one leg of said U-shape forming a finger region and the aperture of said U-shape forming a palm region; and,
support and rotation means for: (i) supporting said first and second elongate, U-shaped finger dies in parallel, spaced relationship such that the finger regions of said finger dies generally face one another, and such that the finger region

of one of said first and second finger dies is aligned with the palm region of the other of said first and second finger dies, said first and second finger dies being spaced such that a sheet of metal can be positioned between the finger and palm regions of said first and second finger dies such that the finger and palm region of one of said dies lie on one side of said sheet of metal in close proximity thereto and the finger and palm region of the other of said dies lie on the other side of said sheet of metal in close proximity thereto; and, (ii) rotating said die whose palm region is aligned with the finger region of the other die in a manner such that said palm region rotates about said finger region.

4,043,166

REMOVING CRUST OF OXIDE FROM PROFILED WIRE ROD

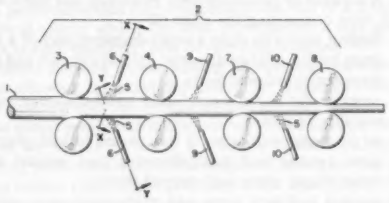
Jean Leroy, Hoboken-Anvers, Belgium, assignor to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Continuation of Ser. No. 439,811, Feb. 5, 1974, abandoned. This application Jan. 29, 1976, Ser. No. 653,569

Claims priority, application Luxembourg, Feb. 12, 1973, 67008

Int. Cl.[2] B08B *3/02*; B21B *45/02*

U.S. Cl. 72—39 **10 Claims**



1. In the known process for the direct and continuous manufacture of copper wire rod starting from liquid metal, in which a bar is produced by continuous casting and conveyed while still hot to a rolling mill where the bar is rolled down into a wire rod in a plurality of roll passes, including a few early roll passes and several later roll passes, and in which process a crust of oxide is present on the surface of the rod being rolled down, the improvement which comprises removing the crust of oxide in at least one cleaning operation between the early roll passes by projecting a liquid selected from the group consisting of water and a rolling emulsion under a pressure of between 20 and 60 atmospheres against the periphery of the rod being rolled down, the flow of said liquid under pressure being less than 50 liters/minute per cleaning operation so as to avoid an appreciable cooling of the rod being rolled down between the early roll passes, and after the cleaning operation abruptly cooling the rod being rolled down before one of the later roll passes.

4,043,167

PROCESS AND MACHINE FOR FINISHING A 15° TO 180° PIPE BEND WHICH HAS BEEN PREFORMED ON A PIPE BENDING PRESS

Rolf Koser, Bunde, Germany, assignor to Sidro KG Ludwig Moller Fabrik fur Rohrbogen, Bunde, Germany

Filed Aug. 13, 1976, Ser. No. 714,161

Claims priority, application Germany, Jan. 23, 1976, 2602415

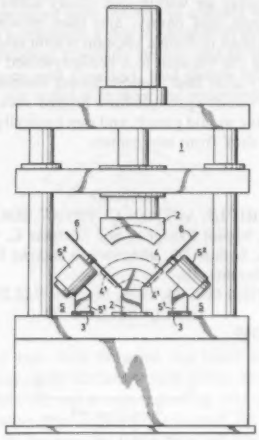
Int. Cl.[2] B21D *7/16*

U.S. Cl. 72—340 **8 Claims**

1. A process for finishing a 15° to 180° pipe bend which has been preformed on pipe press, comprising

a. sizing said preformed pipe bend between coacting dies while said pipe bend is at a temperature of 700°-900° C and

b. simultaneously trimming both ends of said pipe bend to precise dimensions while said pipe bend is retained between said dies whereby further finishing of said pipe bend is eliminated.



4,043,168

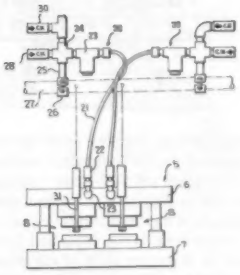
SHELL CONTROL MANIFOLD

Stanley L. Mazurek, Chicago, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Oct. 17, 1975, Ser. No. 623,501

Int. Cl.[2] B21D *45/00*

U.S. Cl. 72—345 **9 Claims**



1. For use in combination with a reciprocating die set, apparatus for holding a formed article relative to the die set against permature release, said apparatus comprising a manifold assembly for controlling air pressure within a sealed die of said die set closed by a formed article, said manifold assembly comprising an air line, means for coupling said air line in communication with the interior of a sealed die, and check valve means coupled to said air line for controlling the exhaust and intake of air, said check valve means including a first check valve permitting exhausting of air while preventing intaking of air and a second check valve for preventing exhausting while permitting limited intaking of air, said check valve means being cooperable to produce a limited vacuum with said sealed die after the forming of an article to retain a formed article thereon while preventing article damage due to a too great vacuum resistance to removal of a formed article from said die, and article removal means of a positive type cooperable with the movement of said die for removing a vacuum held formed article from said die.

8. A method of retaining a shell in a punch comprising the

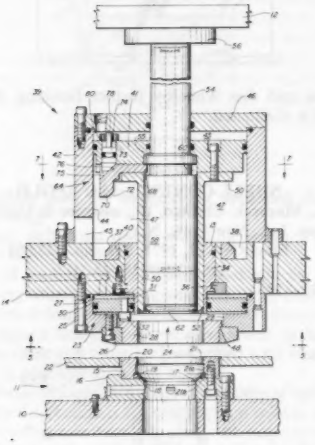
steps of providing a movable punch having a shell receiving cavity, utilizing said punch to form a shell with the shell sealing said cavity, moving said punch relative to a newly formed shell to pressurize air within said cavity while venting compressed air from said cavity, and then moving said punch relative to the shell to form a vacuum within said punch cavity, and restricting the vacuum to a predetermined value by venting said cavity after said predetermined vacuum is formed in said cavity to thereby provide for a limited vacuum holding of the shell relative to said punch, and mechanically removing the vacuum held shell from said punch.

4,043,169

TRIPLE ACTION CUPPING TOOL

Otto Gorgius, Mount Prospect, and Dietmar G. Quaas, Arlington Heights, both of Ill., assignors to Buhrke Industries, Inc., Arlington Heights, Ill.

Filed Oct. 14, 1976, Ser. No. 732,206
Int. Cl.[2] B21D *22/00*
U.S. Cl. 72—349 **5 Claims**



1. In a double-acting cupping press having a bed, an outer slide and an inner slide, the outer slide leading the stroke of the inner slide in degrees of slide-drive crankshaft rotation, the combination with said press of a triple-action blank, draw and redraw cupping tool having a stripper plate which is mounted on a die shoe supported by the press bed, a blanking-die-holder plate mounted on the outer slide of the press, and a draw and redraw punch-holder plate mounted on the innter slide thereof comprising:

a. a punch for blanking, a die for drawing and a redraw die for redrawing mounted on the die shoe on a common centerline in mutually orientated vertical configuration for cooperation thereon in the successive operations of blanking, drawing and redrawing;

b. a blanking die mounted on the blanking dieholder plate for cooperating with the blanking punch in the operation of blanking;

c. an annular draw punch slidingly mounted in the blanking die-holder plate for cooperating with the draw die in the operation of drawing;

d. a redraw punch depending from the draw and redraw punch-holder plate and sliding within the annulus of said draw punch therethrough for operationally cooperating with the redraw die in the operation of redrawing;

e. a latch mounted on said draw punch having biasing means for engaging said latch in a groove in said redraw punch and interlocking the draw punch with the redraw punch; and

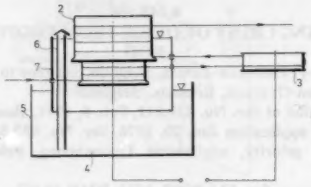
f. a cam means mounted on said latch and said blanking-die-holder plate for operationally disengaging said draw punch from said redraw punch.

4,043,170

PATENTING PROCESS AND APPARATUS COMBINED WITH A WIRE

György Erödi; István Gorondi; László Kovács, and György Takács, all of Miskole, Hungary, assignors to "December 4" Drotmuvek, Miskolc, Hungary

Filed Feb. 19, 1976, Ser. No. 659,353
Claims priority, application Hungary, Feb. 20, 1975, DE 881
Int. Cl.[2] B21D *31/00, 37/16*
U.S. Cl. 72—364 **2 Claims**



1. A method of simultaneously patenting and hot-forming a metal wire comprising the steps of:

a. feeding said wire onto a small-diameter part of a stepped drum having a large-diameter cylindrical part and a small-diameter cylindrical part;

b. passing said wire around said small-diameter part in a plurality of turns;

c. leading said wire after it has passed in said plurality of turns around said small-diameter part around a guide drum spaced from said stepped drum;

d. passing said wire from said guide drum onto said large-diameter part;

e. passing said wire in a plurality of turns around said large-diameter part and thereafter leading said wire away from said stepped drum;

f. passing an electric current through the wire between said drums sufficient to heat said wire to a patenting and hot-forming temperature; and

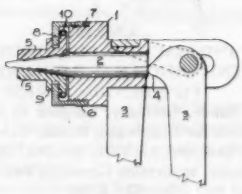
g. contacting said turns of wire on said stepped drum with a patenting bath.

4,043,171

BRANCH TOOL

Anthony Haldane Ray Brookman, Wattle Park, Australia, assignor to Rast Patent Manufacturers Pty. Ltd., North Plympton, Australia

Filed June 9, 1976, Ser. No. 694,477
Claims priority, application Australia, June 13, 1975, 1982/75
Int. Cl.[2] B21D *41/02*
U.S. Cl. 72—393 **8 Claims**



1. A device for forming a socket in the side of an apertured tube where a branch tube is to be joined to it comprising, a series of circularly arranged jaws, a body to hold the said jaws to be outwardly movable to expand the metal around an aperture in a tube positioned over said jaws, a former to engage said

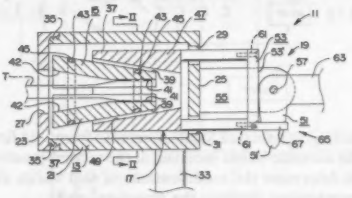
tube adjacent to said aperture, said former being carried by said jaws by tapered interengaging surfaces therebetween, and means to simultaneously expand the said jaws in a substantially radial direction and move said former in axial relationship to said jaws to draw the wall of the tube surrounding said aperture outwardly from said tube to form the said socket.

4,043,172

TUBE COMPRESSOR

Louis A. Schmittou, 1304 Latham, Memphis, Tenn. 38106

Filed June 10, 1976, Ser. No. 694,888
Int. Cl.² B21D *41/04*
U.S. Cl. 72—402 **10 Claims**



1. A portable device for compressing the end of a length of cylindrical tubing which has been expanded to a size greater than its normal diameter, said device comprising:

a. hollow housing means having an opening therethrough for allowing the expanded end of the length of tubing to be inserted into the interior of said housing means;

b. die means positioned in the interior of said housing means, said die means including a plurality of die members for being positioned around the length of tubing in said housing means, each of said plurality of die members having a sloping outer surface and having a curved inner surface for engaging the expanded end of the tubing, said curved inner surface of each of said plurality of die members having substantially the same curvature as the normal diameter of the tubing;

c. sleeve means positioned in the interior of said housing means for placement about said die means and for forcing said plurality of die members inwardly to compress the end of the length of the tubing, said sleeve means having a sloping inner surface; and

d. activating means for selectively causing said sleeve means to force said plurality of die members inwardly to uniformly compress the expanded end of the length of tubing, said activating means including cam means pivotally attached to said housing means and including cam follower means fixedly attached to said sleeve means for causing said sleeve means to force said plurality of die members inwardly to compress the expanded end of the length of tubing when said cam means is activated.

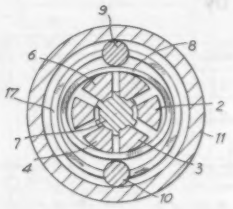
4,043,173

METHOD OF SHAPING THE OUTER SURFACES OF OBJECTS CONSISTING OF DEFORMABLE MATERIALS AND DEVICE FOR THE APPLICATION OF THE METHOD

Zdzislaw Marciniak; Mateusz Sklad, and Krzysztof Chodnikiewicz, all of Warsaw, Poland, assignors to Politechnika Warszawska, Warsaw, Poland

Continuation-in-part of Ser. No. 542,831, Jan. 21, 1975, abandoned. This application June 8, 1976, Ser. No. 693,909
Claims priority, application Poland, Jan. 21, 1974, 168236
Int. Cl.² B21K *1/30*; B21J *7/16*
U.S. Cl. 72—403 **4 Claims**

2. Apparatus for shaping the outer surface of a workpiece of a material which can be deformed, comprising a casing; a flywheel within said casing; a ring-shaped tool mounted within said casing and being adjustable in the axial direction, said tool having a plurality of forming segments interconnected directly with one another, said segments being firmly held at at least one corresponding end thereof, said segments being movable relative to one another in the radial direction, said segments being in the operative state initially in contact with said outer surface of said workpiece; a sleeve secured to the inside of said casing and extending coaxially within and in radially-spaced relationship from said flywheel, said sleeve being resiliently deformable in the radial direction and encompassing said segments; at least two rolls between the inner surface of said flywheel and the outer surface of said sleeve and pressing said sleeve onto said tool; and a cage mounting said rolls and determining the relative angular positions thereof, the roll diameters being relative to the annular space between said inner surface of said flywheel and said outer surface of said sleeve so that said sleeve is deformed and at least three of said segments are forced against said outer surface of said workpiece while the remaining said segments are with drawn from said outer surface of said workpiece.

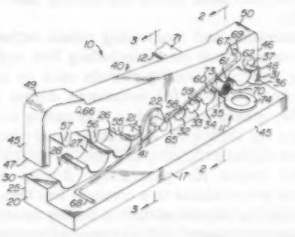


4,043,174

WIRE CONNECTOR CRIMPING DEVICE

Angelo J. Paolino, Waterbury, Conn., assignor to American Eyelet Co. Inc., Waterbury, Conn.

Filed Sept. 27, 1976, Ser. No. 726,581
Int. Cl.² B21D *9/08*
U.S. Cl. 72—412 **9 Claims**



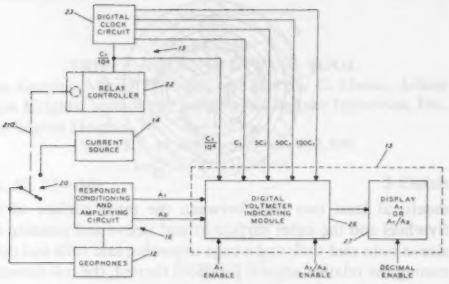
1. A wire connector crimping device for crimping a plurality of connector sizes, said device comprising an elongate base having a generally flat underside, a plurality of connector receivers disposed in side-by-side upwardly facing relation on said base and each extending generally transversely of said base, a rocker pivotally mounted intermediate its ends on said base and extending over said receivers for swinging movement of opposite rocker ends portions toward and away from respective receivers, stop means on said base and rocker to limit said swinging movement in opposite directions, a plurality of crimping formations depending from said rocker for movement into and out of crimping relation with respective receivers, for optimal crimping of a connector on a wire by placement in an appropriate receiver and swinging the rocker to move the appropriate crimping formation into its crimping relation.

4,043,175

AUTOMATIC METHOD AND APPARATUS FOR DIGITALLY INDICATING RESPONSE CHARACTERISTICS OF GEOPHONES OF A GEOPHYSICAL DATA ACQUISITION SYSTEM

Oke A. Fredriksson, and Elmer L. Thomas, both of Fullerton, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 1, 1975, Ser. No. 618,602
Int. Cl.[2] G01V *13/00*
U.S. Cl. 73—1 DV **18 Claims**



1. Circuit for testing a geophone of a data acquisition system by initially forcing a coil of said geophone from its natural rest position, then releasing said coil and monitoring damped coil vibration at an output of said geophone by digitally indicating response representations related to first and second adjacent, first occurring peak amplitudes of said vibration above and below a horizontal datum line, whereby geophone performance characteristics can be determined, comprising:

a generator for forcing said coil from its rest position and then releasing said coil;

means for generating and monitoring first and second response waveforms having peak amplitudes A_1 and A_2 related to said damped coil vibration peak amplitudes after said generator has released said coil of said geophone from its off-normal position, said A_1 and A_2 peak amplitudes being the first peak above (or below) a datum and the next-in-time peak below (or above) said datum, respectively;

said generating and monitoring means including (i) analog responder circuit means including first and second amplifying and conditioning circuits each in series with said geophone output; (ii) automated digital indicating and display means connected to said analog responder circuit means for separately generating binary digits, said automated digital indicating and display means including associated means for generating, storing and comparing counts proportional to a constant less than one times said A_2 response representation whereby counts proportional to and indicative of said A_1 response representation and an A_1/A_2 representation can be accurately generated and displayed so that geophone performance characteristics can be determined.

4,043,176

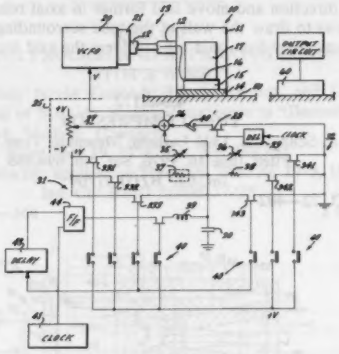
ACOUSTIC WHITE NOISE GENERATOR

Lloyd J. Graham, Newbury Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed June 21, 1976, Ser. No. 697,818
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—1 DV **5 Claims**

5. A method of subjecting structural parts to the influence of ultrasonic waves comprising the steps of:

generating with a single piezoelectric transducer a plurality of separate bursts of acoustic energy over a broad band, each of said separate acoustic bursts simulating the different frequency spectrum of a different acoustic emission, and coupling said bursts to said part at a selected first location thereof; and



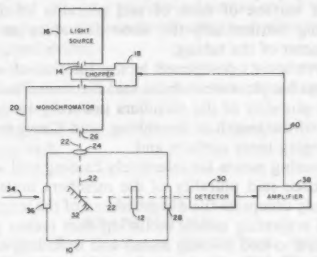
detecting at a second location remote from said first location the acoustic bursts received at the second location in order to determine the modifications in said bursts due to their propagation through the structural part.

4,043,177

METHOD TO OBSERVE DAMAGE INDUCED IN OPTICAL ELEMENTS BY INTENSE THERMAL RADIATION

Roderick D. Swift, Belmont, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 22, 1976, Ser. No. 679,309
Int. Cl.[2] G01N *25/00*
U.S. Cl. 73—15 R **1 Claim**



1. A process for detecting optical damage induced in optical elements by intense thermal radiation comprising:

projecting a monochromatic light beam onto a movable mirror;

folding the path of said monochromatic light beam onto an optical element, scanning the wavelength of said monochromatic light beam across the spectral bandpass of said optical element;

electrically converting the transmitted radiation into an electronic signal;

amplifying said electronic signal and displaying said signal as a strip-chart recording;

displacing said mirror from its original position;

exposing said optical element to a pulse of intense thermal radiation;

moving said mirror back to its original position;

projecting a monochromatic light beam onto said mirror;

folding the path of said monochromatic light beam onto said optical element scanning the wavelength of said monochromatic light beam across the spectral bandpass of said optical element;

electrically converting the transmitted radiation onto an electronic signal;

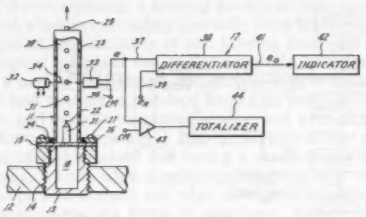
amplifying said electronic signal and displaying said signal as a strip-chart recording.

4,043,178

HYDROGEN PROBE SYSTEM

Joseph D. Winslow, Jr., Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed May 6, 1976, Ser. No. 683,878
Int. Cl.[2] G01N 7/10
U.S. Cl. 73—23 **17 Claims**



1. A hydrogen probe system comprising:

a. a ferrous metal probe body adapted to be exposed to a corrodant, said body having an enclosed fluid-tight internal cavity for collecting hydrogen gas produced by action of the corrodant on said body;

b. a sample cell containing a background liquid chemically inert and in which hydrogen has a relatively low solubility;

c. capillary port means in said sample cell connected by a fluid channel to said cavity, and said capillary port means precisely metering discrete uniform-dimensioned bubbles of hydrogen gas into said background liquid;

d. detector means sensing the release of hydrogen gas bubbles into said background liquid and providing an output signal representative thereof; and

e. output means receiving said output signal and providing a readout of the hydrogen gas bubbles being released from said capillary port means.

4,043,179

NON-DESTRUCTIVE TESTING OF BONDING LAMINATES

Harold R. Ingle, Jr., 2665 Jamerson Road, NE., Marietta, Ga. 30066

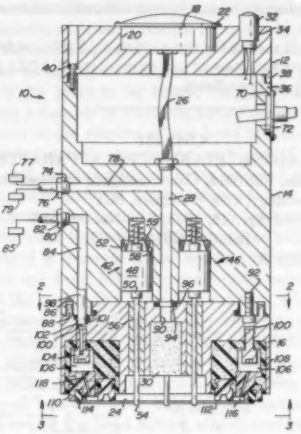
Filed July 9, 1976, Ser. No. 703,994
Int. Cl.[2] G01N 29/00
U.S. Cl. 73—37 **15 Claims**

1. Apparatus for non-destructive tested of bonded laminates which include a substrate and a face sheet bonded thereto, comprising:

a vacuum chamber adapted to contact the surface of said face sheet as said apparatus is drawn across said face sheet;

means for applying a vacuum to said vacuum chamber thereby urging said face sheet into said vacuum chamber;

compressed air means for counteracting the normal force of said vacuum with respect to said face sheet to permit said apparatus to be drawn across said face sheet while said vacuum is maintained in said vacuum chamber; and



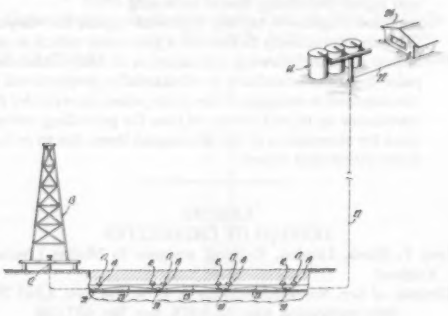
means for detecting the magnitude of the displacement of said face sheet into said chamber.

4,043,180

GATHERING LINE LEAK DETECTION SYSTEM TESTER

David A. Morris; Norman E. Flournoy, both of Richmond, and Thomas W. Langley, Bon Air, all of Va., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 10, 1975, Ser. No. 639,547
Int. Cl.[2] G01M 3/00; G08B 29/00
U.S. Cl. 73—40.5 A **6 Claims**



6. In combination with a gathering line for petroleum products wherein said gathering line is subject to developing one or more leaks there along,

said gathering line having a plurality of acoustic leak detectors directly coupled thereto and spaced at predetermined intervals there along for detecting and locating a leak,

an acoustic oscillator permanently attached to said gathering line and associated with each of said leak detectors and coupled to said gathering line adjacent to each detector for testing whether said detector is operative, and

means for selectively activating each of said oscillators and identifying which of said oscillators is activated, comprising

means for producing a predetermined number of pulses, including a bistable multivibrator and a manual switch for shifting said multivibrator from one state to the other,

a binary counter associated with each of said oscillators for providing binary type output signals in accordance with said number of pulses,

binary encoded means associated with each of said oscilla-

tors including selectable alternative circuits for said binary type output signals,

first circuit means for connecting said binary type output signal producing means to said selectable alternative circuits, and

second circuit means for connecting said selectable alternative circuits to a pair of interconnected NAND gates for energizing said oscillator.

4,043,181

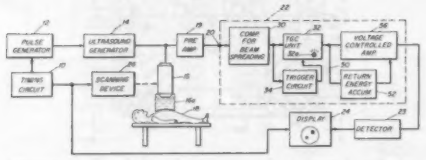
ULTRASONIC PULSE-ECHO APPARATUS

Anant K. Nigam, Fairfield, Conn., assignor to New York Institute of Technology, Old Westbury, N.Y.

Filed Apr. 18, 1975, Ser. No. 569,185

Int. Cl.² G01N *29/00*

U.S. Cl. 73—67.8 R **14 Claims**



1. In ultrasonic pulse-echo apparatus of the type including a transducer for directing a beam of ultrasound pulses toward a multilayered object to be examined and for converting ultrasound echo pulses reflected from interfaces between the layers within the object into electrical pulses, and television-type display means responsive to the electrical pulses for displaying the image of said object, the improvement comprising:

signal processing means connected between said transducer and said display means for varying the gain of said electrical pulses and coupling the pulses to said display means, said signal-processing means including

first means responsive to said electrical signals for varying the gain interactively to provide a gain value which at any instant of time following transmission of each ultrasound pulse from the transducer is substantially proportional to the cumulative energies of the echo pulses received by the transducer up to said instant of time for providing corrections for attenuation of the ultrasound beam due to reflections within said object.

4,043,182

TESTING OF CIGARETTES

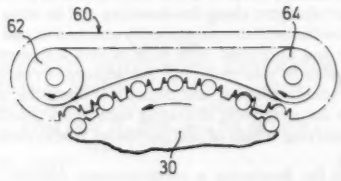
Ivan Y. Hirsh, London, England, assignor to Molins Limited, England

Division of Ser. No. 466,839, May 3, 1974, Pat. No. 3,943,752. This application Aug. 22, 1975, Ser. No. 607,038

Claims priority, application United Kingdom, May 8, 1973, 22002/73

Int. Cl.² G01M *3/26*

U.S. Cl. 73—41 **3 Claims**



1. In a cigarette testing device for testing the joint between the wrapper and the filter of filter cigarettes, the improvement comprising a drum on which each cigarette is carried during testing and a belt extending around part of said drum and having a width considerably narrower than the length of a cigarette, said belt having integrally molded portions at regular intervals defining with the drum an annular space only around the area of the joint between the wrapper and the filter of each cigarette at a testing station whereby the cigarette is tested and integrally molded teeth in the belt which engage in recesses in said drum whereby the belt is driven by the drum.

4,043,183

CONSISTOMETER WITH SENSORS FAILURE AND SENSORS MISALIGNMENT INDICATING MEANS

Kenneth O. Higgs, Port Neches, and Lawrence F. Marsch, Port Arthur, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Sept. 1, 1976, Ser. No. 719,627

Int. Cl.² G01N *11/14*

U.S. Cl. 73—59 **6 Claims**

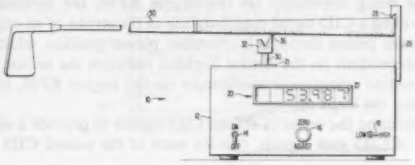
1. Apparatus for continuously measuring the consistency of a stream of material comprising a rotatable resilient member located in said stream so that the opposite surfaces about which said member is flexible are substantially parallel to the direction of flow in said stream, means for rotating said member at a constant rate about an axis which is parallel to the direction of flow in said stream, a reference member, means for rotating the reference member in synthronism with the resilient member, resilient member sensing means spatially related to the resilient member for providing a resilient member signal in accordance with the movement of the resilient member, reference member sensing means spatially related to the reference member for providing a reference member signal in accordance with the movement of the reference member, noise means connected to both sensing means for providing an enabling pulse in accordance with the reference member signal and the resilient member signal, first comparison means connected to the reference member sensing means and to the noise means for comparing the reference member signal with a predetermined voltage, corresponding to an acceptable reference member signal level, when enabled by an enabling pulse and providing a first comparison signal at one level when the reference member signal is an acceptable signal and at another level when it is not acceptable and for not making the comparison when the noise means does not provide an enabling pulse when not making the comparison; reference member pulse means connected to the first comparison means for providing a reference member pulse in response to the first comparison signal going from the other level to the one level; resilient member pulse means connected to the resilient member sensing means for providing a resilient member pulse in accordance with the resilient member signal; means connected to both pulse means for providing an output corresponding to the consistency of the material; and first and second display means, each display means being connected to a corresponding sensing means for providing a visual display indicating that the sensing means is providing a signal in accordance with the movement of its corresponding member.

4,043,184

APPARATUS FOR MEASURING THE SWING WEIGHT OF SPORTING IMPLEMENTS

Bernard Sayers, Sharp Lane, Newport, N.J. 08345

Filed Nov. 18, 1975, Ser. No. 632,948
Int. Cl.[2] G01M *1/10*
U.S. Cl. 73—65 3 Claims



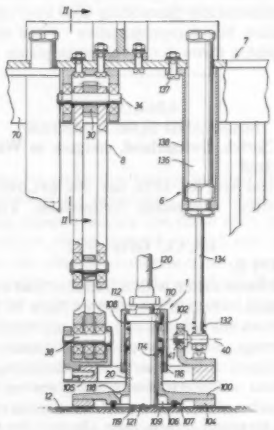
1. An apparatus for measuring the dynamic and dead weight of a golf club comprising, a housing having an opening in the top thereof, a bracket extending upwardly from said housing at a point spaced longitudinally of said housing from said opening, a flange at the upper end of said bracket, a lower surface forming a part of said flange, an electric weight measuring device in said housing, a standard having its lower end connected to said weight measuring device and extending upwardly through said opening, a fulcrum support affixed to the upper end of said standard and having a cradle transverse to said housing, a knife edge member defining one side of said cradle and parallel thereto, said edge member terminating in a plane spaced below the plane of said lower surface of said flange a distance equal to the diameter of the grip of said golf club whereby a golf club can be secured to said apparatus by placing the grip end under said lower surface and an intermediate portion of said shaft on said edge member and the moment measured by said device, and means on said housing to convert the moment measurement into a numerical readout.

4,043,185

DEVICE FOR NON-DESTRUCTIVE TESTING OF ROLLED STEEL PLATE AND THE LIKE

Hans-Werner Siebert, Oxelosund, Sweden, assignor to Granges Oxelosunds Jarnverk AB, Sweden

Filed Feb. 13, 1976, Ser. No. 658,100
Claims priority, application Germany, Feb. 13, 1975, 2506072
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—67.7 23 Claims



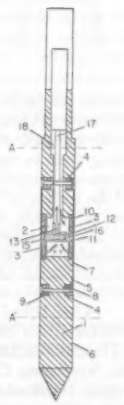
1. A device for the non-destructive testing of rolled steel plate and the like for the presence of internal flaws or defects, such as non-metallic inclusions, inhomogeneities and the like, comprising a carriage adapted to be traversed in relation to the surface of the plate to be tested and parallel thereto, said carriage having attached thereto, through the medium of connecting links, at least one ultrasonic test head including an ultrasonic transmitter and an ultrasonic receiver supported by a test head holder and adapted to be tilted about two mutually perpendicular tilting axes extending substantially parallel to the surface of the plate to be tested, the said connecting links comprising a number of elevating means the number of which corresponds to the number of test head holders present, each said elevating means cooperating with one of said test head holders, said elevating means being adapted individually to raise and lower said test head holders at right angles to said plate surface, characterized in that said connecting links associated with each test head holder comprise both an elevating cylinder and a separate guide means adapted positively to guide said test head holder in a direction extending at right angles to the raising and lowering direction, said guide means including two pairs of toggle lever means having first strut means proximal to said carriage and provided with toothed portions adapted to ensure positive symmetrical deflection of said first strut means in relation to the raising and lowering direction of said test head holders, and second strut means proximal to said test head holder, said second strut means and said elevating cylinder being coupled to said test head holder through pivotal joints having a common rotational axis constituting one of said two tilting axes of said test head holder.

4,043,186

FLAT EXPANSIBLE MEMBRANES ARRANGEMENT TO MEASURE ON LOCATION THE MODULE OF DEFORMABILITY OF TERRAINS NOT REQUIRING THE EXECUTION OF SOUNDING PERFORATIONS

Silvano Marchetti, Via Bracciano, 38-00159, Roma, Italy

Filed Oct. 29, 1975, Ser. No. 626,625
Claims priority, application Italy, Oct. 31, 1974, 53837/74
Int. Cl.[2] G01N *3/00*
U.S. Cl. 73—84 8 Claim



1. Probe to measure the modulous of terrain deformability in situ, comprising parallelipiped shaped probe rods tapering to a point for penetration into the terrain, a pressure chamber communicating with the outside through two circular openings situated on opposite faces of said probe body, two expansible metal membranes sealingly covering said circular openings said metal membranes becoming hemispheroidally shaped upon the introduction of compressed air to said chamber; means for introduction and removal of said air from said chamber and electrical contact means acting in response to the movement of said metal membrane.

4,043,187

METHOD OF MEASURING SURFACE ROUGHNESS

Kenichi Tomomatsu, Kawasaki, Japan, assignor to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Oct. 15, 1976, Ser. No. 733,022
Claims priority, application Japan, Oct. 16, 1975, 50-124719
Int. Cl.[2] G01B *5/28*
U.S. Cl. 73—105 **3 Claims**

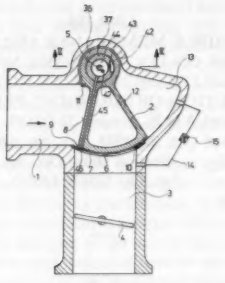
1. A method of measuring surface roughness comprising the steps of applying a replica material with good releasability on the surface of an object to be measured to form a replica film on said surface, stripping off said replica film to thereby form a first replica, applying on the surface of said first replica a layer on a non-hardened synthetic resin of the type which becomes high in hardness when hardened, separating said first replica after hardening of said resin to form a second replica, and measuring roughness of the surface of said second replica with a tracer.

4,043,188

AIR FLOW METER FOR INTERNAL COMBUSTION ENGINE

Volkhard Stein, Stuttgart, and Wolf Wessel, Oberriexingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 22, 1976, Ser. No. 743,736
Claims priority, application Germany, Dec. 5, 1975, 2554724
Int. Cl.[2] G01F *1/28*
U.S. Cl. 73—116 **5 Claims**



1. In an air flow rate meter for use in association with the air induction tube of an internal combustion engine, said air flow rate meter being pivotably disposed in said air induction tube and subjectd to a restoring force in opposition to the force of the air flow, the improvement comprising:

providing portions of the surface of said air flow rate meter with static mechanical features to impede air flow between said surface and the inside wall surface of said induction tube to thereby serve as a labyrinth seal.

4,043,189

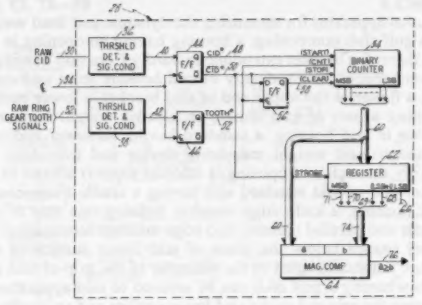
ENGINE, CYLINDER IDENTIFICATION (CID) TRANSDUCER

Rinaldo Robert Tedeschi, Newington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 7, 1976, Ser. No. 684,221
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—117.3 **4 Claims**

3. In an engine diagnostic method of the type which monitors the operation of a combustion engine and provides signal information representative of the engine operating performance characteristics, the signal information including a series of sensed, periodic cylinder identification (CID) signal pulses representative of the stroke of an engine cylinder piston through a reference piston position as provided by a sensor in response to the cyclic displacement of an engine component member having a cyclic function directly related to the piston stroke of the cylinder, each CID pulse having a pulse width in dependence on the spatial distance between the sensor and the member during its cyclic displacement and on the period of the member displacement cycle which is related to the instantaneous revolutions per minute (RPM) of the engine, the signal information further including a series of tooth signal pulses, each representative of a corresponding one of a plurality of gear teeth disposed on the ring gear assembly of the engine flywheel housing the tooth signal pulse frequency tooth signal pulse being dependent on the engine RPM; the method of providing a CID signal manifestation of the stroke of an engine cylinder piston through a reference piston position which is not dependent on the spatial distance between the sensor and the engine component member or on the engine RPM, comprising the steps of:

detecting the series of sensed CID signals to provide a series of CID gate signals, one for each of the sensed CID signals, each having a time duration in dependence on the pulse width of a corresponding sensed CID signal, the time duration of each representing a CID interval;



counting the tooth signal pulses present within each of said CID intervals, to provide an instantaneous tooth count signal having a magnitude representative of the instant number of tooth signal pulses present within each of said CID intervals, and to provide a total tooth count signal having a magnitude representative of the total number of tooth signal pulses present within each of said CID intervals; and

providing a signal manifestation whenever the instantaneous tooth count signal magnitude from a present CID interval exceeds one-half of the total tooth count signal magnitude from an immediately preceeding CID interval, said signal manifestation being representative of the stroke of the cylinder piston through the reference piston position.

4,043,190

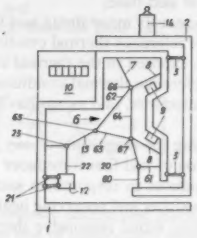
MASS AND FORCE METER

Mario Gallo, Zurich, Switzerland, assignor to Wirth, Gallo & Co., Switzerland

Filed May 28, 1976, Ser. No. 691,095
Claims priority, application Switzerland, Feb. 9, 1976, 001576/76
Int. Cl.[2] G01L *5/12*
U.S. Cl. 73—141 R **4 Claims**

1. Mass and force meter with a frame, a load-support and a measuring system, wherein the mass or force to be measured acts indirectly on the tension of two transversally vibrating, pre-loaded strings excited by electronic means, so that the resultant frequency changes serve for calculating the magnitude of said mass or force in a computing device, both strings, a first transmission element for the transmission of a pre-loading force and a second transmission element for the transmission of a force depending on the load to be measured being fixed to a force distributor guided in a statically determined way relative to the frame by means of the two strings and by means of at least one guide with respect to the pre-loading

force and with respect to the force depending on the load to be measured, characterized in that the force distributor comprises



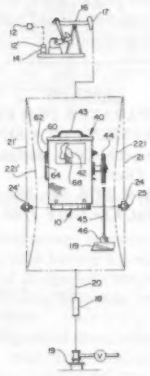
three parts forming a triangle and that both strings, the guide and both transmission elements are fastened to the corners of the force distributor.

4,043,191

DYNANOMETER FOR A PUMP-OFF CONTROL

Manuel Dee Mills, 2808 Delano, Midland, Tex. 79701

Filed May 20, 1976, Ser. No. 688,130
Int. Cl.[2] G01L *5/04*
U.S. Cl. 73—151 **21 Claims**



1. Apparatus for measuring tension in a pair of spaced, elongated, parallel members, comprising, in combination, a discontinuous spring member having the distal ends thereof spaced from a midportion, clamp means by which said distal ends are attachable to the elongated members to cause each of said elongated members to be biased out of parallel relationship while said distal ends are springingly moved respective to one another in proportion to movement of said elongated members;

a sensor means connected to sense a change in the magnitude of the sprung relationship of said distal ends respective to one another and to said midportion;

said sensor means includes a scribe mounted to be moved in proportion to relative movement of said distal ends;

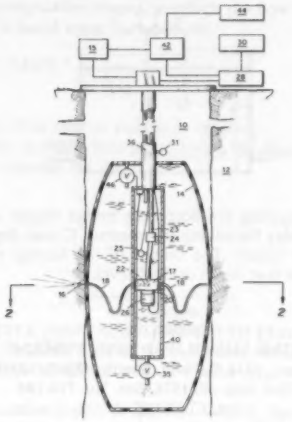
and a chart means connected to contact said scribe such that movement of said scribe respective to said chart means provides stored data related to the relative position of said distal ends.

4,043,192

APPARATUS FOR PROVIDING DIRECTIONAL PERMEABILITY MEASUREMENTS IN SUBTERRANEAN EARTH FORMATIONS

Lowell Z. Shuck, Morgantown, W. Va., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 8, 1976, Ser. No. 694,117
Int. Cl.[2] E21B *47/10*
U.S. Cl. 73—155 **3 Claims**



1. A device for providing in situ measurements indicative of the direction of maximum permeability and the magnitude of the permeability in a subterranean earth formation, comprising an inflatable housing containing a plurality of apertures penetrating the housing at circumferentially spaced-apart locations, means for selectively inflating said housing within a wellbore penetrating said earth formation to place said apertures in registry with said earth formation, a plurality of conduits within said housing coupled to said apertures and to a source of high-pressure fluid, means for selectively directing high-pressure fluid from said source through selected conduits to said earth formation, and means responsive to the pressure drop of the high-pressure fluid through said conduits for providing measurements indicative of the direction of maximum permeability and the magnitude of permeability in said subterranean earth formation.

4,043,193

METHOD AND APPARATUS FOR MEASURING VOLUME AND DENSITY OF FLUIDS IN A DRILLING FLUID SYSTEM

John M. Bailey, Houston, Tex., assignor to Bailey Mud Monitors Inc., Thibodaux, La.

Filed Aug. 3, 1976, Ser. No. 711,297
Int. Cl.[2] E21B *47/04*
U.S. Cl. 73—155 **8 Claims**

1. The method for measuring volume and density of mud in mud pits in a drilling fluid system comprising the steps of:

a. placing a first sensor a fixed distance above the bottom of the mud pit,

b. placing a second sensor a fixed distance above said first sensor in the mud pit,

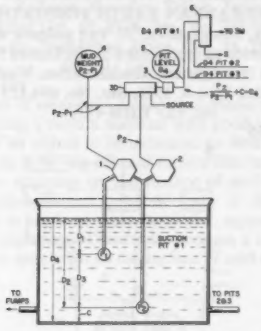
c. communicating the output of said first and said second sensors to a differential pressure transmitter,

d. communicating the output of said first sensor to an absolute pressure transmitter,

e. introducing the absolute pressure transmitter reading as an input to a Sorteberg bridge,

f. communicating the output of said differential pressure transmitter to a gauge displaying mud weight in units of

pounds per gallon, and as an input to said Sorteberg bridge, and



g. communicating the Sorteberg bridge output through a biasing relay for adding the constant C mud depth below said first sensor. The output of the biasing relay then represents true depth of fluid level.

4,043,194

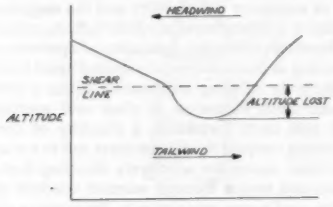
WIND SHEAR WARNING SYSTEM

Jesse H. Tanner, 3434 S. 144th, Seattle, Wash. 98168

Filed Aug. 20, 1976, Ser. No. 716,190

Int. Cl.[2] G01C *21/00*

U.S. Cl. 73—178 T **12 Claims**



1. A method of determining wind conditions along the projected flight path of an aircraft comprising the steps of:

measuring the in-line wind velocity and determining its direction at the threshold of a runway;

measuring the in-line wind velocity and determining its direction at the aircraft;

comparing the measured in-line wind directions to determine if a wind shear zone as indicated by oppositely moving wind currents will be crossed if the aircraft continues on the projected flight path;

calculating the velocity differential between the oppositely moving wind currents when a shear zone is determined to be present along the aircraft flight path; and

comparing the calculated velocity differential with known aircraft operating characteristics for various wind shear velocity differentials to determine if the aircraft can safely pass through the shear zone.

4,043,195

DIGITAL THERMODYNAMIC FLOW-METER

Curtis J. Hunting, 1808 E. Altenda Drive, Altadena, Calif. 91001

Filed Mar. 13, 1975, Ser. No. 552,500

Int. Cl.[2] G01F *1/68*

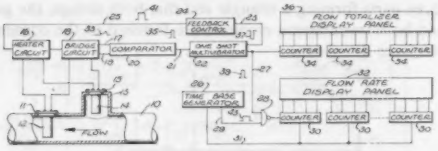
U.S. Cl. 73—204 **5 Claims**

1. A digital thermodynamic flowmeter for measuring and counting mass flow rate of a fluid comprising:

a. first and second temperature-sensitive electrical output transducers disposed in the flow path of said fluid; said first transducer being directly exposed to the main flow path of said fluid, said second transducer being shielded from the direct flow path but disposed to detect the ambient temperature of said fluid;

b. means for simultaneously maintaining said first and second transducers under reference thermal conditions while said first transducer is exposed to the thermal conditions to be measured, said reference thermal conditions being above fluid ambient temperature, said means having an input and an output;

c. means for detecting the magnitude of any deviation from reference condition of said first transducer with respect to said second transducer in response to said fluid flowing past said first transducer and removing heat therefrom and providing an output signal responsive thereto;



d. means for initiating a discrete electrical power pulse responsive to said output signal from said means for detecting said deviation, said power pulse having a constant width for varying flow rates;

e. means for applying said discrete power pulse to said first transducer, said discrete power pulse having sufficient power to return said transducer to said thermal reference condition irrespective of the volume of fluid flowing thereby;

f. counting means responsive to said output signal to reproduce a digital signal proportional to said mass flow; and

g. display means connected to said counting means for displaying the resulting counts.

4,043,196

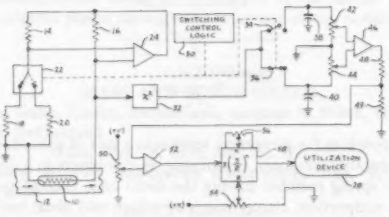
METHOD AND APPARATUS FOR EFFECTING FLUID FLOW MEASUREMENT IN A SINGLE SENSOR

James H. Trageser, Dayton, Ohio, assignor to Technology Incorporated, Dayton, Ohio

Filed Feb. 9, 1976, Ser. No. 656,183

Int. Cl.[2] G01F *1/68*

U.S. Cl. 73—204 **11 Claims**



1. A method for measuring the mass flow rate of a fluid flowing in a conduit comprising the steps of:

A. disposing a single temperature sensitive resistive element in heat transfer communication with the fluid

B. causing the temperature sensitive resistive element to assume a first temperature (Ts_1) above that of the fluid by passing a current therethrough;

C. determining the power (P_1) necessary to maintain the temperature sensitive resistive element at the first temperature;

D. causing the temperature sensitive resistive element to

assume a second temperature (Ts_2) above that of the fluid by passing a current therethrough;

E. determining the power (P_2) necessary to maintain the temperature sensitive resistive element at the second temperature; and

F. calculating the mass flow rate (m) by solving the equation:

$$\dot{m} = \left[\frac{\frac{P_2 - P_1}{Ts_2 - Ts_1} - A}{B} \right]^n = \text{mass flow rate}$$

wherein:

A = an empirically determined constant for zero flow (dependent on size of temperature sensitive resistive element and specific fluid properties)

B = an empirically determined constant for other than zero flow (also dependent on size of temperature sensitive resistive element and specific fluid properties)

n = an empirically determined constant dependent on physical size and shape of temperature sensitive resistive element.

4,043,197

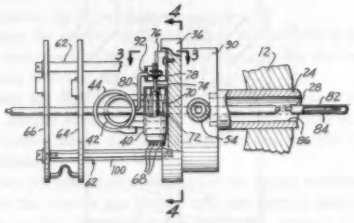
FLOW RATE TRANSDUCER

Carl A. Mounteer, and Anthony T. Sizgorich, both of Irvine, Calif., assignors to Gulton Industries, Inc., Metuchen, N.J.

Filed Nov. 4, 1976, Ser. No. 740,934

Int. Cl.[2] G01F *1/38;* G01L *7/04*

U.S. Cl. 73—205 R **4 Claims**



4. In a transducer for measuring the flow rate of a fluid, the combination of

a pressure differential sensor comprised by a helically configured Bourdon tube having a pressure inlet at each end thereof and a seal in the tube disposed equidistant from said inlets and dividing each tube into two separate pressure sensing portions;

a linear variable differential transformer associated with the pressure sensor, said linear variable differential transformer including a transformer core, a transformer input circuit and a transformer output circuit;

means for connecting said pressure sensor at the seal to the core of said transformer so that movement of the seal moves the core of the transformer;

first fluid pressure inlet means;

means for connecting said first fluid pressure inlet means to one pressure inlet of said pressure sensor for communicating the pressure at said first fluid inlet means to said sensor;

second fluid pressure inlet means for receiving a reduced pressure from a flow measuring device of the class comprised by orifices and venturis through which the flow to be measured flows;

means for connecting said second pressure inlet means to the other pressure inlet of the pressure transducer to communicate the pressure of said second pressure inlet means to said other sensor pressure inlet, whereby the position of the sensor transformer core is a function of the pressure differential across the sensor seal representing the pressure drop generated by the flow measuring device;

transformer actuation means operable to energize the transformer input circuits to produce a transformer output signal in the transformer output circuit, said output signal being a function of the position of the core and therefore of the pressure differential across the seal;

computation means operable in response to the output signal transformer output circuit to compute flow rate; and

means for applying the signal transformer output circuit to the computation means, in which the flow rate computation is based upon the equation:

$$Q_f = K_3[\Delta P]^{1/2}$$

when

Q_f is the flow rate by weight or volume,

ΔP is the pressure differential across the sensor seal, and

K_3 is a constant for the device.

4,043,198

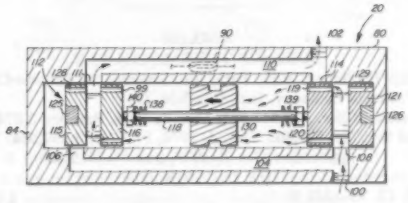
POSITIVE DISPLACEMENT FLUID FLOWMETER

Logan W. Stillwell, 1305 E. Second Place, Mesa, Ariz. 85203, and George K. Riffle, 2632 E. Pincho Ave., Phoenix, Ariz. 85016

Continuation-in-part of Ser. No. 648,865, Jan. 14, 1976, abandoned, which is a division of Ser. No. 579,507, May 21, 1975, abandoned. This application Nov. 19, 1976, Ser. No. 743,275

Int. Cl.[2] G01F *9/00*

U.S. Cl. 73—242 **10 Claims**



1. A positive displacement flowmeter for receiving fluid from a pressurized source thereof and for contnuously dispensing said fluid therefrom in precise volumetric increments, said flowmeter comprising:

a. a body defining an axial bore and having first and second opposite ends closing said bore;

b. an inlet port in said body for receiving said fluid;

c. an outlet port in said body for discharging said fluid:

d. metering means including:

i. a valving member axially shiftable within said body,

ii. a piston reciprocally slideable within said bore defining first and second volume chambers on respective sides thereof,

said valving member shiftable in response to said piston between a first position for establishing communication between said first chamber and said inlet port and between said second chamber and said outlet port, and a second position for establishing communication between said second chamber and said inlet port and between said first chamber and said outlet port; and

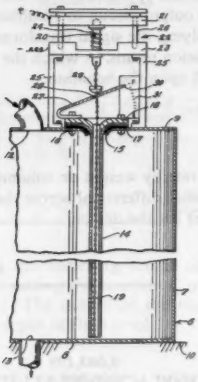
e. magnetic means exerting a predetermined force for alternately attracting and holding said valving member to said first position and said second position.

4,043,199

LEVEL INDICATOR FOR GRANULATE STORAGE TANKS

James H. Greer, 239 Thisbe Ave., Cincinnati, Ohio 45233

Filed June 1, 1976, Ser. No. 691,629
Int. Cl.[2] G01F *23/00*
U.S. Cl. 73—290 R 4 Claims



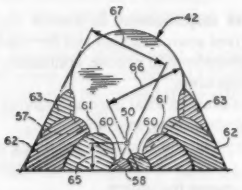
1. A device for indicating the level of flowable granulate in a storage tank, comprising a non-stretchable laterally collapsible sleeve disposed vertically within the tank for embedment in the granulate, a flexible, longitudinally contractile member freely hung inside and coextensive with the sleeve, a releasable means supporting the member within the sleeve, a weight sensing means adapted to support a portion of the member upon operation of the releasable means, and scale means associated with the weight sensing means to record the volume of granulate in the tank.

4,043,200

SURFACE THERMOCOUPLE

Philip F. Finney, Villa Park, Ill., assignor to Thermo-Couple Products Company, Inc., Winfield, Ill.

Division of Ser. No. 447,961, Mar. 4, 1974, Pat. No. 3,874,239, and Ser. No. 529,405, Dec. 4, 1974, Pat. No. 3,939,554. This application Oct. 2, 1975, Ser. No. 619,239
Int. Cl.[2] G01K *1/04*
U.S. Cl. 73—359 R 1 Claim



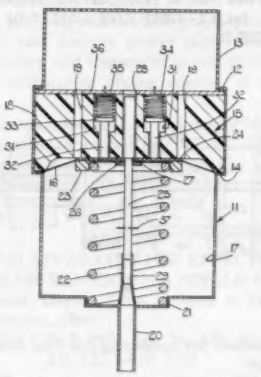
1. The method of mounting a thermocouple assembly on the surface of a furnace tube, wherein the tube is subjected externally to high temperature gases and flame and carries a fluid to be heated and wherein the thermocouple assembly includes an elongated tubular metal sheath, a pair of spaced thermocouple conductors within the sheath, electrical insulating material spacing and supporting said conductors within the sheath in insulating relation from each other and from the sheath, said conductors extending from the cold junction end for connection to the readout instrument, said conductors at the hot junction end being bent at substantially right angles to the sheath axis and extending through an opening in the sheath wall, a ceramic insulating plug in the opening receiving and holding said conductors in spaced and insulated relation from each other and from the sheath, a fusion wels at the ends of the conductors outside the plug defining the thermocouple hot junction, and a pad integral with the sheath and the hot junction, said pad having a substantially knife-shaped edge for direct engagement with the surface for which the temperature is to be monitored, which method comprises the steps of placing the knife-shaped edge of the assembly against the surface of the tube, and applying a void-free weldment between the pad and the tube such that the heat path between the hot junction and the outer tube surface is substantially less than the heat path between the hot junction and the nearest surface subjected to gases and flames.

4,043,201

FLUID PRESSURE TRANSDUCER

Michael Derek Cunnell, Salisbury, England, assignor to Lucas Electrical Limited, Birmingham, England

Filed May 3, 1976, Ser. No. 682,866
Int. Cl.[2] G01L *9/00*
U.S. Cl. 73—398 AR 9 Claims



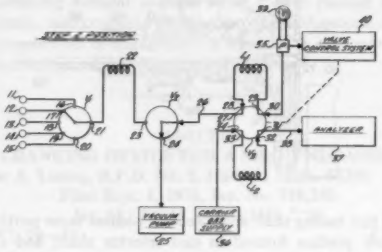
1. A fluid pressure transducer including a hollow body divided into first and second compartments which are sealed from one another, the first compartment being connected, in use, to a first source of fluid at a pressure to be monitored, while the second compartment is connected to a reference source, said compartments including a common wall which is deformable in response to variations in the pressure of said first fluid source as compared to that of said reference source, a carrier mounted in one of said compartments adjacent said common wall and secured to the body, a conductive contact member rigidly secured to said common wall and capable of linear movement towards and away from said carrier in response to deformation of said common wall, a plurality of electrically conductive plungers slidably mounted in respective bores in the carrier and resiliently urged to project from the carrier so as to become engaged with or disengaged from respective portions of said contact member at different positions respectively of said contact member relative to the carrier, whereby in use the number of said plungers engaging said contact member varies in accordance with variations in the pressure of said first fluid source as compared to that of said reference source, and means for producing an electrical output depending upon the number of said plungers engaging said contact member.

4,043,202

SAMPLE INJECTION SYSTEM FOR ANALYZERS

Jay D. Etheridge, Sand Springs, Okla., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Mar. 19, 1976, Ser. No. 668,780
Int. Cl.[2] G01N *1/22*
U.S. Cl. 73—422 GC **6 Claims**



1. A vacuum loop sample injection system for injecting a predetermined amount of sample from a sample source into a system for analyzing said sample, and comprising:

a. a vacuum source;

b. means defining an enclosure having a predetermined volume;

c. means for detecting the pressure within the enclosure means and for producing a signal indicating that pressure within said enclosure means has reached a predetermined amount;

d. a source of carrier gas;

e. means for selectively connecting the enclosure means to be vacuum source, so that the fluid inside the enclosure means is evacuated;

f. means for selectively connecting the enclosure means to the sample source, so that the vacuum created within the enclosure means causes a portion of said sample to fill the enclosure;

g. means for selectively placing the enclosure means in series with the carrier gas source and the sample analyzer system, so that the carrier gas forces the sample isolated in the enclosure into the analyzing system; and

h. means for actuating the means for selectively placing the enclosure means in series with the carrier gas source and the sample analyzing means in response to the signal from the pressure detecting means indicating that the predetermined pressure in the enclosure means has been reached, so that when the enclosure means is being filled with the sample and reaches a predetermined pressure, the enclosure means is switched in series with the carrier gas source so that the predetermined amount of sample is injected in the sample analyzer.

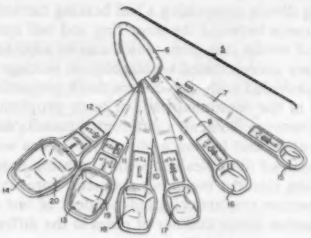
4,043,203

SPOON HOLDER AND MEASURING SPOON SET

Edward N. Montesi, Barrington, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed June 23, 1976, Ser. No. 698,976
Int. Cl.[2] G01F *19/00*
U.S. Cl. 73—427 **10 Claims**

1. A measuring spoon set comprising a connecting rod and a plurality of spoons, each spoon having a handle and an integral bowl at one end thereof, each of said respective bowls having different maximum capacities, an inwardly extending slot at the end of each handle opposite the end to which the bowl is affixed said slot being partly circular in configuration and including an extension therebeyond that is wider than the circular part thereof to permit flexing of the portion of the handle on each side of the slot, and said connecting rod being substantially circular in cross-section and approximately the



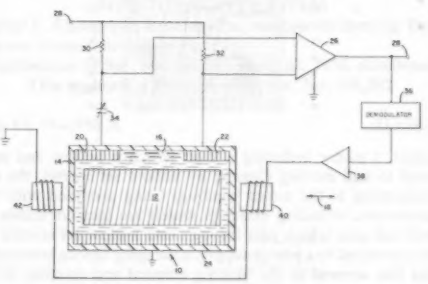
same diameter as the circular part of the slot so that such can snap into the slot and be removably held therein.

4,043,204

MAGNETIC FLUID BEARING ACCELEROMETER

Joe S. Hunter, and Little J. Little, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 16, 1976, Ser. No. 714,881
Int. Cl.[2] G01P *15/08*
U.S. Cl. 73—516 R **3 Claims**



1. A fluid accelerometer including:

a. a non-magnetic housing having a cylindrical interior;

b. A magnetic cylinder carried in said housing;

c. a magnetic fluid carried in said housing about said magnetic cylinder;

d. a capacitance bridge means cooperating with said magnetic cylinder for providing a voltage which is proportional in direction and magnitude to applied acceleration said bridge means including a first plate in the interior of said housing adjacent a first end thereof, a second plate in the interior of said housing adjacent a second end thereof, said first and second plates being disposed on one side of said magnetic cylinder, a common plate disposed in the interior of said housing substantially along the length thereof and on a second side of said magnetic cylinder which is opposite said first side; and,

e. means for providing closed loop operation of said accelerometer by aiding or opposing the magnetic field associated with the magnetic cylinder.

4,043,205

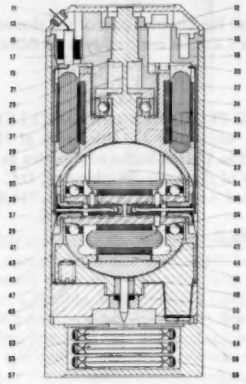
MINIATURIZED PRECISION SPEED GYROSCOPE

Michele Merlo, Via Domodossola 11, Milan, Italy

Filed June 4, 1976, Ser. No. 693,261
Claims priority, application Italy, Jan. 9, 1976, 19126/76
Int. Cl.[2] G01C *19/20*
U.S. Cl. 74—5.5 **1 Claim**

1. A miniaturized precision speed gyroscope comprising a

housing, on the outer surface of which two prismatic millings are formed, a bottom connected to said housing and carrying a moving element by means of a torsion bar fitted with an impact protecting device comprising a ball bearing carried on said bar with clearance between the inner ring and ball crown thereof, two end of stroke stop pins, which can be adjusted from outside and are accomodated within conical seatings in said bottom and provided with stop collars, teeth projecting from said stop pins in the rotational path of teeth projections, in turn, from said moving element, a differential transformer internally of said bottom and having a plurality of poles with only one coil for each of the poles and with a rotating core secured to said moving element including magnetic cores constituted as circular sectors magnetically independent of one another and half in number as the number of poles in the differential trans-



former, a motor including a shaft which is hollow and is secured to said moving element by hollow set screws, the two connections to the motor windings being provided with two connectors, including bushings which are located within the shaft and pins which pass through said hollow set screws and are connected to a power supply, a damping device comprising four fins secured to the moving element and rotating within four slots provided with four crossing bimetallic plates, located in pairs in different planes for varying the aperture of the slot bottom as the temperature varies, a liquid filling the free space in said housing, and three air bells enclosed within three resilient silver caps immersed in said liquid, the connection between different and interlocked parts of the gyroscope being effected by conical surfaces with stop collars for ensuring both axially and radially positive and simple positionings.

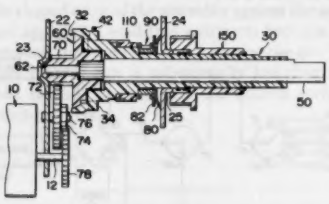
4,043,206

CHANNEL SELECTING SHAFT MOUNTING ARRANGEMENT FOR UHF TUNERS

Michiaki Narihiro, and Akira Nishimura, both of Ueno, Japan, assignors to New Nippon Electric Company, Ltd., Osaka, Japan

Filed Apr. 15, 1975, Ser. No. 568,302
Claims priority, application Japan, Apr. 18, 1974, 49-44524
Int. Cl.² F16H *35/18*
U.S. Cl. 74—10.54 **15 Claims**

1. A channel selecting device for a UHF tuner having a continuously variable main tuning shaft rotation of which is effective selectively to receive signals from all television stations in the UHF television band, which comprises; a selector shaft; a detent wheel secured to said selector shaft and having a series of lobes in the periphery thereof; spring detent means adapted to engage the lobes of said wheel for establishing a plurality of equally spaced detent positions for said selector shaft; a fine tuning shaft positioned inside said selector shaft; a drive gear secured to said fine tuning shaft; gear means for interconnecting said drive gear and said main tuning shaft; padless clutch means for transmitting rotation of said selector shaft to said drive gear while permitting rotation of said fine tuning shaft independently of said selector shaft when said selector is restrained by said detent means, said clutch means including a first padless taper portion on a hub member secured



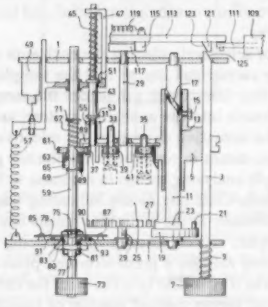
to said fine tuning shaft and a second padless taper portion on a hollow portion formed in said selector shaft; and clutch biasing means for exerting a force along the axes of said shafts to urge said first taper portion and said second taper portion to frictionally engage one another so as to align said selector shaft with said fine tuning shaft.

4,043,207

FREQUENCY SELECTOR COMPRISING A FREEWHEEL COUPLING

Eddy Johan Clarisse, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 7, 1975, Ser. No. 620,297
Claims priority, application Netherlands, Oct. 14, 1974, 7413449
Int. Cl.² F16H *35/18;* **H03J** *5/02*
U.S. Cl. 74—10.15 **6 Claims**



1. In a frequency selector comprising a first control member mounted for operational movement; a tuning assembly with pre-selection capability, including a tuning device, a plurality of adjustable members, means for mounting said adjustable members and for selecting one of said members in response to operational movement of said control member, and coupling means comprising a coupling member for controlling the tuning device in response to displacement of said coupling member by a selected one of said adjustable members; a second control member; means for positioning said second control member for movement between first and second stable positions, in said first stable position said second control member being engaged with said selected one of said adjustable members for fine adjustment motion of said selected member, and in said second stable position said second control member being disabled from engaging any of said adjustable members; and means for moving said second control member from said first

to said second position in response to operational movement of said first control member,

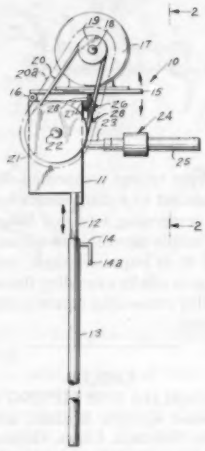
the improvement wherein said first and second control members and mounted for slidable translational movement along parallel paths for said operational movement and said movement between said first and second stable positions respectively, and said tuning assembly includes a coupling element slidable along a path parallel to said paths, said coupling element moving said second control member out of engagement in response to said operational movement of said first control member.

4,043,208

CRANKING DEVICE FOR A SILO UNLOADER

Duane A. Losing, R.F.D. No. 1, Hawick, Minn. 56246

Filed Sept. 1, 1976, Ser. No. 719,359
Int. Cl.[2] F16M *3/00*; F16H *7/10*
U.S. Cl. 74—16 **4 Claims**



1. A cranking device for a silo unloader, comprising a reduction gear box, adjustable leg means secured to said gear box, providing elevation means therefor, motor base plate means adjustably secured to said gear box, pulley and belt means secured to said device for driving the output shaft of said reduction gear box and clutch means secured to one of the shafts of said reduction gear box.

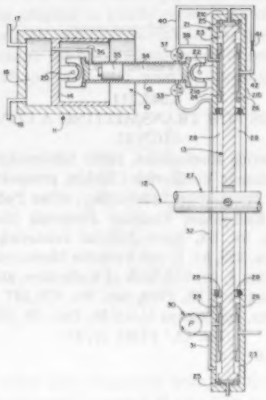
4,043,209

HYDROSTATIC BEARING LUBRICATION SYSTEM

Karl J. Bea, 128 Dewitt St., Syracuse, N.Y. 13203

Filed June 23, 1976, Ser. No. 698,837
Int. Cl.[2] F16H *23/00*; F04B *1/14*
U.S. Cl. 74—60 **9 Claims**

1. A hydrostatic bearing lubrication system for a swash plate compressor or engine in which the compressor or engine has a piston reciprocating in a cylinder with the piston connected to and reciprocating with a stator in which a rotating and oscillating rotor is mounted and with a hydrostatic bearing shoe mounted to the stator and between the stator and rotor at a position subject to continuously variable pressure loading of the piston and the stator on the rotor, said system comprising a lubricating fluid reservoir, a pump connected to deliver a lubricating fluid under substantially constant pressure to said reservoir, pressure means operating responsive to pressures within said cylinder to directly apply substantially corresponding pressures to said reservoir, conduit means connected between said reservoir and said bearing shoe to deliver lubricating fluid under pressure between said bearing shoe and said



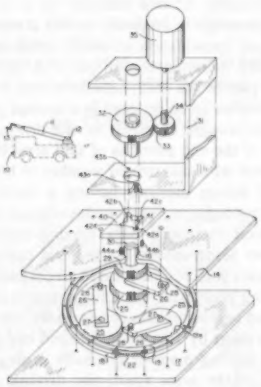
rotor, and means for returning lubricating fluid draining from between said bearing shoe and said rotor to said pump.

4,043,210

ROTATOR DRIVE SYSTEM

Walter C. Updegrave, Reading, Pa., assignor to Reading Techmatic Corporation, Reading, Pa.

Continuation of Ser. No. 464,075, April 25, 1974, abandoned.
This application Nov. 19, 1975, Ser. No. 634,302
Int. Cl.[2] F16H *3/44*
U.S. Cl. 74—750 R **21 Claims**



1. A drive system for a rotatable member comprising a shaft rotatably mounted relative to the rotatable member, a drive means for driving the shaft, a sun gear mounted on the shaft, a ring gear, a support, means for fixedly mounting the ring gear on the support, at least two rotatable planet gears in engagement with the sun gear and the ring gear, the axes of rotation of the planet gears, the sun gear and its shaft being substantially parallel, means mounting the planet gears on the rotatable member and coupling means interconnected between said drive means and said rotatable member for allowing the axis of rotation of the shaft to shift radially relative to the ring gear with motions which lie in a plane to which said axes of rotation of said planet gears are perpendicular with the axis of rotation

of said sun gear, said shaft and said planet gears remaining parallel as said axis of rotation of said shaft shifts radially.

4,043,211

APPARATUS FOR TRANSMITTING A COMMAND SIGNAL

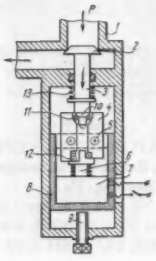
Nikolai Trofimovich Romanenko, ulitsa Smolenskaya, 5/1, kv. 20, Kiev; Alexandr Vasilievich Chichin, prospekt Lenina, 1, kv. 201; Ivan Frantsevich Lyaskovsky, ulitsa Pobedy, 83, kv. 80, both of Kuibyshev; Vladimir Jurievich Melnik, ulitsa B.Lepse, 43a, kv. 54, Kiev; Nikolai Ivanovich Medinsky, ulitsa Mirnaya, 155, kv. 8, and Valentin Matveevich Yakunin, prospekt Lenina, 1, kv. 143, both of Kuibyshev, all of U.S.S.R.

Filed Oct. 28, 1974, Ser. No. 626,207

Claims priority, application U.S.S.R., Oct. 28, 1975, 2070141

Int. Cl.[2] F16H *21/44*

U.S. Cl. 74—110 **2 Claims**



1. In an apparatus for transmitting a command signal from a linearly displaceable driving member to a driven member which is displaceable in response to the command signal, a command signal transmission assembly comprising two arms having pivotally mounted central portions and opposite end portions, one pair of the end portions of said arms straddling the driving member to be retained in a normal position, either spread apart or brought together, by said driving member, the opposite pair of the end portions of said arms being in operative engagement with said driven member to hold the same in position, said driven member having a wedge-shaped end piece, said arms engaging said wedge-shaped end piece in a wedged relation therewith, said driving member and said driven member being axially aligned and comprising axially displaceable rods with respective end pieces facing each other, said arm having pivot axes extending transversely of the axes of the rods, and resilient means acting on the driven member to urge the arms apart by said wedge-shaped end piece, said end piece of said driving member normally urging said opposite end portions of the arms apart, the driving member being displaceable by a command signal to produce pivoting of said arms and displacement of said driven member, intermediate rolling bodies interposed between the wedge-shaped surface of the end piece of the driven rod and the end portions of the arms adjacent thereto and further rolling bodies interposed between the engagement surfaces of the opposite end portions of the arms and the end piece of the driving rod, said rolling bodies cooperating with planar engagement surfaces of the arms of the end pieces of the rods, said rolling bodies being in the form of rollers extending transversely of the common axis of the rods and parallel to the pivot axes of the arms, and wherein in the area of the engagement between the driving rod and the adjacent end portions of the arms a single one of said rollers is located on one side of the end piece of said rod and two said rollers are located on the opposite side thereof.

4,043,212

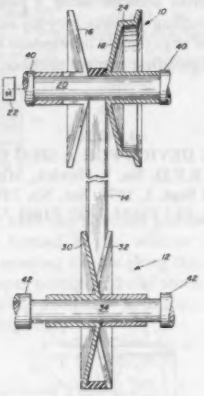
VARIABLE DRIVE

John Craig Warner, Ithaca, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 12, 1976, Ser. No. 666,387

Int. Cl.[2] F16H *55/49, 55/56*

U.S. Cl. 74—230.17 A **5 Claims**



1. A variable drive system comprising driveR and driveN pulleys, each connected to a shaft, means connecting the pulleys, each pulley comprising a pair of flanges, the flanges of each pulley being axially movable toward and away from each other and relative to its respective shaft, one flange of one of said pulleys having an axially extending flat-surfaced outer rim to receive said pulley connecting means in the final drive ratios between said pulleys.

4,043,213

DRIVE ASSEMBLIES FOR MINING APPARATUS

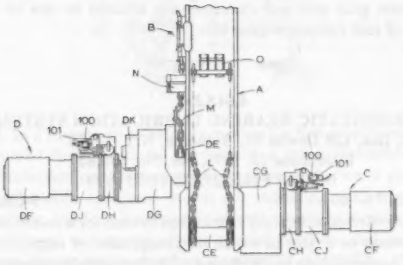
John Gibson, Newton Aycliffe, England, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Germany

Filed Nov. 16, 1976, Ser. No. 742,323

Claims priority, application United Kingdom, Nov. 17, 1975, 47257/75

Int. Cl.[2] F16H *7/08, 7/10*

U.S. Cl. 74—242.8 **15 Claims**



1. A drive assembly for a mineral mining installation, said assembly comprising:

a. a rotatable output member;

b. a transmission;

c. a main motor for driving said rotatable output member via said transmission; and

d. a chain-tensioning device for driving said rotatable output member at a reduced speed:

said transmission comprising:

1. main gearing in driving connection with said rotatable output member;
2. a gear input shaft for said main gearing; and
3. a resilient coupling device in driving connection with said main gearing via said gear input shaft and in driven connection with said main motor;

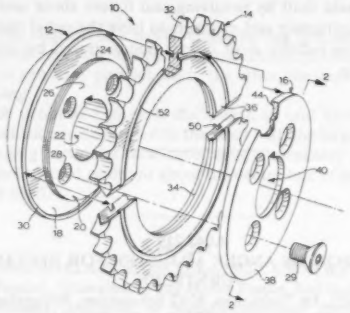
wherein said chain-tensioning device and said resilient coupling device are mounted in the same housing.

4,043,214

SPROCKET, GEAR OR PULLEY WITH INTERCHANGEABLE RIM

Glen Edgar Westlake, 403 Bent Crescent, Richmond Hill, Ontario, Canada

Filed Apr. 13, 1976, Ser. No. 676,498
Int. Cl.[2] F16H *55/12, 55/30*
U.S. Cl. 74—243 DR **8 Claims**



1. A sprocket, gear or pulley having a replaceable peripheral portion, comprising:

a hub having an axial, cylindrical boss circumferentially threaded on its outer surface;

an annular member having mechanical power transmission engagement means along the outer rim thereof and threaded along the inner rim thereof for engagement with the boss; and

means removably secured to the hub to hold the annular member immovable therebetween, the annular member and the hub having interlocking annular flange and groove means and the annular member and the holding means having interlocking annular flange and groove means, whereby the annular member is retained immovably in engagement with the hub.

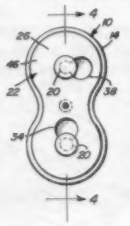
4,043,215

CHAIN MASTER LINK CONSTRUCTION

Walter J. Long, 1574 Iris Way, Upland, Calif. 91786; Stephen W. Long, 10016 Santa Anita, Montclair, Calif. 91763, and Robert P. Long, 1574 Iris Way, Upland, Calif. 91786

Filed May 4, 1976, Ser. No. 683,197
Int. Cl.[2] F16G *13/02*
U.S. Cl. 74—258 **7 Claims**

1. In combination, an elongated master link side link having a pair of transverse bores formed through its opposite end portions adapted to receive the free circumferentially grooved ends of a pair of master link pins therethrough, and an elongated retaining clip adapted for engagement over said side link and with the extended grooved ends of said pins for retaining said side link on said pins, one end of said clip including first means defining a first opening formed therethrough including communicated large and small width portions, said large width portions being adapted to axially receive one of said pin ends therethrough, said small width portion opening toward the other end of said clip into said large width portion and adapted to snugly and seatingly receive the grooved portion of said one pin therein, the other end of said clip including means defining a second opening formed therethrough including communicated greater and lesser width portions, said greater width portion being adapted to axially receive the other of said pin ends therethrough, said lesser width portion opening in a direction transverse to the longitudinal extent of said clip into said greater width portion, said second opening being spaced



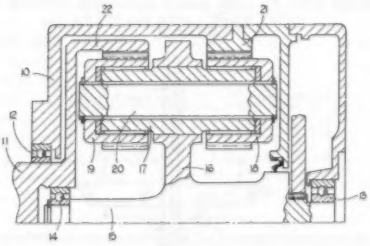
toward said other end of said clip from said first opening, said clip being positionable, relative to said link, in predetermined position with said small and lesser width portions registered with said bores, and said clip and link including coacting means releasably retaining said clip against angular displacement relative to said link about an axis extending centrally through said small width portion of said first opening.

4,043,216

COMPOUND PINIONS FOR USE IN EPICYCLIC GEAR BOXES

Ronald John Steer, Pudsey, England, assignor to Lucas Industries Limited, Great Britain

Filed Oct. 9, 1975, Ser. No. 620,928
Claims priority, application United Kingdom, Oct. 11, 1974, 44214/74
Int. Cl.[2] F16H *35/10*
U.S. Cl. 74—410 **7 Claims**



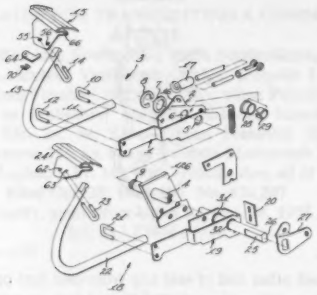
1. A compound pinion for use in an epicyclic gearbox, said pinion comprising a tubular shaft portion, a pair of pinion portions mounted on opposite ends of said shaft portion for free rotation relative thereto, the mounting of the pinion portions on the tubular shaft portion being relatively stiff and a resilient torsionally flexible member extending through said shaft portion and connected at its ends to the two pinion portions, the flexible member adapted to deflect and twist to ensure that the load is substantially evenly shared within prescribed tolerances by the pinion portions, and, thus, the pinion portions only having freedom to move portionally relative to one another.

4,043,217

BRAKE PEDAL

Earl F. Kleist, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 4, 1976, Ser. No. 711,650
Int. Cl.[2] G05G *1/14*
U.S. Cl. 74—470 **10 Claims**



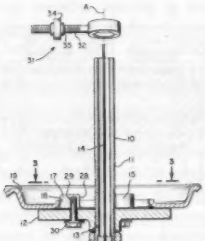
1. A pedal comprising, a base member, mounting means pivotally supporting said base member, a shank member forming an arcuate segment and radial arm for connection with said base member, means adjustably fastening said shank member on said base member to adjustably set the radial length of said radial arm to equal the radius of curvature of said arcuate segment of said shank, a food pad, means fastening said foot pad to the end of said arcuate segment, a mounting flange on said foot pad, a tread portion on said foot pad, a resilient fold in said foot pad between said tread portion and said mounting flange to provide a shock absorbing means for reducing the pedal forces transmitted from said pedal to pedal operated mechanisms.

4,043,218

PORTABLE WHEEL-BALANCER

Lawrence H. Groeper, 5223 Armida Drive, Woodland Hills, Calif. 91364

Filed Nov. 26, 1976, Ser. No. 745,395
Int. Cl.[2] G01M *1/12*
U.S. Cl. 73—486 **5 Claims**



1. A portable wheel-balancer including, in combination:

a. a hollow vertical shaft having a suspending wire secured axially to the interior of said shaft and passing out the top thereof;

b. a flat plate centrally secured to the shaft at a level such that the point of securement of said wire is slightly above the center of gravity of a wheel carried on said plate;

c. at least three members on said plate equally circumferentially and radially spaced from the axis of said shaft to define three engagement points for the inside peripnery of the hub opening in a wheel to be balanced so that said wheel itself is held in coaxial relationship with said shaft when resting on said plate, any imbalance of said wheel resulting in a tipping of the plate detectable by observing the extending portion of the suspending wire from the top of said shaft, each of said members being individually mounted on the surface of said plate so that the radial distance of the engaging portion of each member can be changed by individual movement of the members to accommodate center hub openings in wheels of different sizes; and

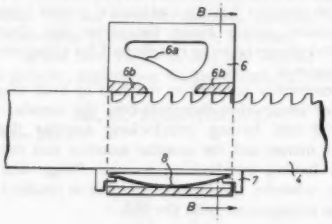
d. a fixture in the form of a threaded stud terminating at one end in a collar receivable over said shaft and at its other end in a threaded nut defining a flat surface facing said collar, threading of said nut changing the radial distance between said flat surface and the axis of said shaft when said collar is received over said shaft, said flat surface serving as an indexing means to enable adjustment of the engaged portions of said members at equal radial distances from said shaft by revolving said fixture about said shaft and positioning said members to have the radial distances of these radially most distant points grazed by said flat surface.

4,043,219

SLIDER FOR AN ANGLE ADJUSTER FOR RECLINING FURNITURE

Josef Schatti, Im Tschachen, 8762 Schwanden, Switzerland

Filed Apr. 11, 1975, Ser. No. 567,194
Claims priority, application Germany, Jan. 24, 1975, 2502963
Int. Cl.[2] G05G *5/06*
U.S. Cl. 74—536 **10 Claims**



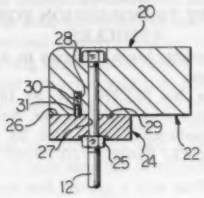
1. In an angle adjuster for reclining furniture having firstly a rack with a series of rack teeth along an upper face thereof and a smooth lower face extending substantially parallel to said series of rack teeth, secondly a lever pivoted about a first axis at one end of said series of rack teeth, and thirdly a strut which is pivoted about a second axis to said lever, carries a cam follower member, and is formed at an end remote from said second axis to engage any one of said rack teeth for the adjustment of the angle between said lever and said rack, a slide mounted to slide relatively to said rack and formed with a cam surface engaging said cam follower member for controlling the position of said strut in relation to the improvement comprising said series of rack teeth, said slide having a portion thereof beneath but spaced from said lower face of said rack, and inserted means interposed between said portion and said lower face providing a surface in sliding contact with said lower face and also providing resilient reaction on said slide maintaining said lower face and surface in contact, at least one of said lower face and said surface being formed of synthetic plastics material.

4,043,220

ADJUSTABLE CONTROLS OF A WORK VEHICLE

David L. Kolb, St. Charles, Mo., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 21, 1976, Ser. No. 697,882
Int. Cl.[2] G05G *1/06, 5/18*
U.S. Cl. 74—543 5 Claims



1. In the controls of a work vehicle having first and second shafts, each movable between first and second positions along pathways generally parallel one to the other, the improvement comprising:

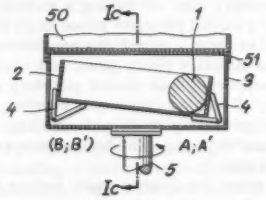
a knob connected to each shaft, each of said knobs being eccentrically connected to the shaft with the largest overhanging portion of each knob being controllably movable to preselected positions about the center line of its respective shaft.

4,043,221

MASS-IMBALANCE OSCILLATION GENERATOR

Dieter Peschel, Schwalbach, and Dieter Funke, Bad Soden, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 16, 1975, Ser. No. 568,734
Claims priority, application Germany, Apr. 18, 1974, 2418641
Int. Cl.[2] F16F *15/22*
U.S. Cl. 74—573 R 10 Claims



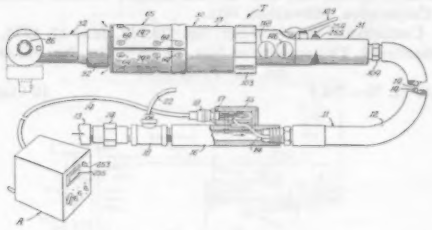
1. An oscillatory drive comprising a rotatable shaft, an imbalance mass entrained by said shaft and shiftable transversely to the axis of rotation thereof, and guide means for controlling the position of said mass to enable said mass to assume an eccentric rest position upon cessation of rotation of said shaft and against a restoring force to enable said mass to assume an end position different from said rest positions under the action of centrifugal force upon rotation of the shaft, said positions having substantially the same angular orientation with respect to said shaft, said guide means further defining an opposite rest position for said mass into which said mass is displaced by said restoring force upon a successive cessation of rotation of said shaft and another end position on the same side as said other rest position and into which said mass is displaced by the reapplication of centrifugal force thereto, said mass and said shaft having a combined center of gravity offset from the axis of said shaft in both of said end positions of said mass, the mass in each end position having a greater potential energy than the mass in the corresponding rest position, said guide means including an inner housing adapted to rock about an axis transverse to the axis of said shaft, an outer housing rotatable by said shaft and receiving said inner housing, and stabilizing levers at opposite sides of said inner housing for transforming lateral centrifugal force thereon to an elevation of the corresponding side of said inner housing.

4,043,222

HOUSING CONSTRUCTION FOR A POWER TOOL

Edmund C. Dudek, St. Charles, Ill., assignor to Thor Power Tool Company, Aurora, Ill.

Division of Ser. No. 359,640, May 14, 1973, Pat. No. 3,920,082.
This application Oct. 6, 1975, Ser. No. 620,034
Int. Cl.[2] F16H *57/02*
U.S. Cl. 74—606 R 7 Claims



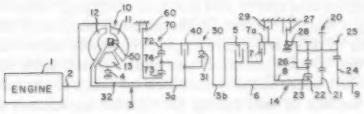
1. A tool assembly, comprising; first housing means having first drive means therein, second housing means having output drive means therein, third housing means connecting said first and second housing means and having second drive means connecting said first drive means and said output drive means, said third housing means having two portions each releasably connected to said first housing means and said second housing means, whereby either of said housing portions may be disengaged from said first housing means and said second housing means to provide access to said second drive means.

4,043,223

OVERDRIVE MECHANISM FOR AUTOMATIC POWER TRANSMISSION

Kiyoshi Ohnuma, and Syuzi Nagano, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 12, 1976, Ser. No. 666,423
Claims priority, application Japan, Mar. 25, 1975, 50-34912
Int. Cl.[2] F16H *47/08;* F16N *57/10*
U.S. Cl. 74—688 8 Claims



1. An overdrive mechanism for automatic transmissions of the type including a change gear mechanism and a torque converter having an input element connected to an engine and an output element operatively connected to said change gear mechanism, said overdrive mechanism comprising:

an input shaft to said change gear mechanism having a first section connected to said output element of said torque converter and a separate second section connected to said change gear mechanism;

clutch means operatively connected to said second section of the input shaft and engaging said first section of the input shaft, said clutch means being disengaged from said first section in response to a predetermined operation of the change gear mechanism;

a planetary gear train including (i) a sun gear, (ii) a carrier

operatively responsive to the input element of said torque converter, and (iii) a ring gear operatively connected to said clutch means; and

overdrive brake means activated in response to said predetermined operation of the change gear mechanism for locking said sun gear against rotation whereby said ring gear is rotated by movement of said carrier in response to movement of said input element of said torque converter, said second section of said input shaft, said clutch means, said planetary gear train and said overdrive brake means all being positioned outside said torque converter.

4,043,224

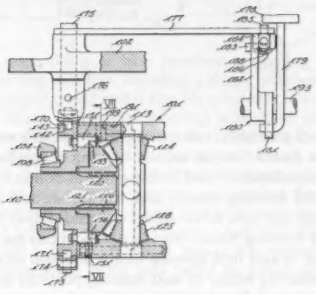
MECHANICAL DIFFERENTIAL LOCK

David C. Quick, New Berlin, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 478,737, June 12, 1974, abandoned. This application Nov. 19, 1975, Ser. No. 633,480

Int. Cl.[2] F16H *1/44*

U.S. Cl. 74—710.5 **10 Claims**



1. A mechanical differential locking means on a differential in a drive mechanism of a motor vehicle comprising, a rear axle drive housing, a pair of drive axles, bearing means in said housing rotatably supporting said pair of drive axles on a common axis, a differential including a differential casing defining support bearing surfaces and a cylindrical collar bearing surface on its outer periphery, a ring gear connected to said differential casing for driving said differential, a pair of support bearings mounted in said housing and rotatably supporting said casing on said support bearing surfaces for rotation on said common axis, a pair of side gears mounted in said casing adapted for driving the pair of rear axles, bearing surfaces in said casing rotatably mounting said side gears or rotation on said common axis, one of said side gears defining a back surface engaging a mating surface on the internal portion of said casing, a pair of differential pinion gears rotatably mounted on an axis normal to said common axis and meshing with said side gears, a shift collar slidably mounted on said cylindrical collar bearing surface of said casing for slidable movement on said common axis, a plurality of cylindrical pins mounted on said collar with each pin defining an axis parallel to the said common axis, means defining a plurality of cylindrical openings of the same size as said cylindrical pins in said differential casing with each opening defining an axis parallel with said common axis and each of said openings extending to said back surface of said one of said side gears and around the outer periphery of said gear, said openings receiving said pins and contacting said pins over the entire portion of the pin extending into said casing, said one side gear defining peripheral semi-cylindrical grooves of the same curvature as said cylindrical pins for receiving said pins, an actuating mechanism including a resilient member biasing said collar and pins reciprocally for selectively engaging said pins from said peripheral grooves on said one side gear for synchronous operation of said side gears when said actuating mechanism is operated, a differential release means including means defining a plurality of holes in said differential casing, resilient means in each of said holes engaging said collar and resiliently biasing said collar with said pins from said peripheral grooves on said one side gear against any residual force in said resilient member for differential operation of said side gears.

4,043,225

POWER SHIFT TRANSMISSION FOR MOTOR VEHICLES

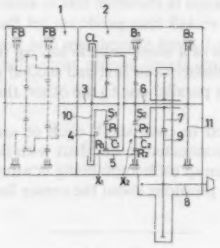
Yutaka Momose, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Continuation of Ser. No. 537,370, Dec. 30, 1974, abandoned. This application Aug. 25, 1976, Ser. No. 717,535

Claims priority, application Japan, Dec. 29, 1973, 49-365

Int. Cl.[2] F16H *57/10, 37/00*

U.S. Cl. 74—761 **4 Claims**



1. A power shift transmission for motor vehicles comprising:

a first planetary gear set having a first sun gear, a plurality of first planetary pinion gears engaged with said first sun gear, a first ring gear interengaged with said first planetary pinion gears, and a first carrier rotatably supporting said first planetary pinion gears and permanently directly connected with an input shaft so as to always be driven by said input shaft.

a second planetary gear set having a second sun gear, a plurality of a second planetary pinion gears engaged with said second sun gear, a second ring gear interengaged with said second planetary pinion gears, and a second carrier rotatably supporting said second planetary pinion gears and connected with an output gear member;

said first sun gear being connected with said second ring gear and said first ring gear being connected with said second sun gear;

a first brake means for simultaneously locking said first sun gear and said second gear to a gear casing; and

a clutch means for directly connecting said second ring gear and said first sun gear with said input shaft.

4,043,226

DISENGAGE MECHANISM FOR GEAR DRIVE

Dennis L. Buuck, Lafayette, Ind., assignor to Fairfield Manufacturing Company, Inc., Lafayette, Ind.

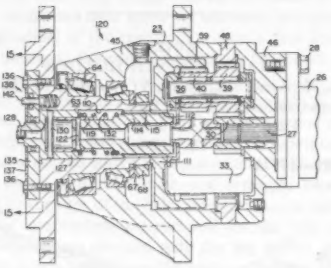
Continuation-in-part of Ser. No. 510,505, Sept. 30, 1974, abandoned. This application Aug. 7, 1975, Ser. No. 602,836

Int. Cl.[2] B60K *17/14, 17/26;* **F16D** *23/14;* **F16H** *1/28*

U.S. Cl. 74—801 **13 Claims**

13. A gear drive and disengage mechanism including in combination a housing, a drive motor secured to said housing and having a drive shaft extending into said housing, a sun gear secured to said drive shaft, a planet carrier, a gear shaft carried by said planet carrier, first and second planet gears rotatively carried by said gear shaft with said first planet gear being in meshing engagement with said sun gear, said first and second planet gears being secured together, said housing including a stationary hub, a cover, a first ring gear interposed between said hub and cover and secured thereto, said first planet gear being in meshing engagement with said first ring gear, a second

rotatable ring gear having a drive portion with first axial splines, said second planet gear being in meshing engagement with said second ring gear, an output spindle rotatably mounted on bearings carried by said stationary hub and positioned coaxial with said second rotatable ring gear, wall means defining a bore extending axially into said output spindle, a drive actuator located within said bore in said output spindle and having means connecting said drive actuator to said spindle and permitting axial movement of said drive actuator between first and second positions relative to said spindle, said drive actuator having second axial splines thereon engageable with said first axial splines in said first position of said drive actuator to connect said drive portion of said second ring gear to said spindle, said drive actuator in said second position disconnecting said spindle from said drive portion of said second ring gear, a cam member surrounding one portion of said drive actuator and having a cam surface thereon, a pin carried by said drive actuator and engageable with said cam surface, a spring engaging said drive actuator to at all times urge said drive actuator to its said first position, said cam member being rotatable between first and second positions and in moving to said first position removing camming force from said pin and permitting said spring to move said drive actuator to its said first position, said cam member in moving to its said second position causing said cam surface to engage said pin



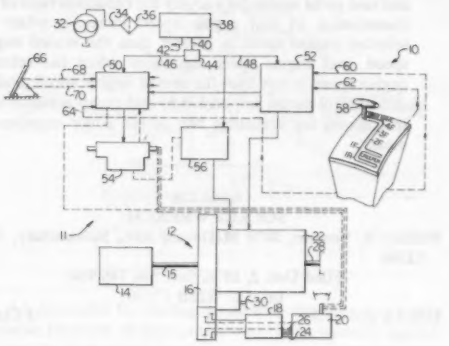
with a camming force to positively move said drive actuator to its said second position against the urging of said spring, a cam actuator surrounding at least a portion of said cam member and extending exteriorly of said bore in a position to be manipulated by an operator of the gear drive and disengage mechanisms, a drive pin extending through said cam actuator and said cam member to connect the two together whereby rotation of said cam actuator causes rotation of said cam member between its said first and second positions, a retainer plate secured to said output spindle to close said bore and having an opening through which said cam actuator extends, a lock member carried by said retainer plate and movable between locked and unlocked positions, spring means constantly urging said lock member to locked position, wall means on the periphery of said cam actuator defining first and second angularly spaced detents with said lock member residing in said first detent in said first position of said cam member and residing in said second detent in said second position of said cam member, indicia on said retainer plate and said cam actuator to visually indicate the position of said cam actuator and said cam member, said cam surface of said cam member having a detent portion to receive said pin carried by said drive actuator in said first position of said cam member which insures against axial movement of said drive actuator from its said first position until initial rotation of said cam member to remove said pin from said detent portion of said cam surface.

4,043,227

HYDROMECHANICAL TRANSMISSION

Charles E. Beals, Pekin, Ill.; Robert O. Chambers, Dorchester, Mass.; Edwin E. Hanson, Peoria, and Ronald L. Satzler, Princeville, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 23, 1975, Ser. No. 607,723
Int. Cl.² B60K *41/04*
U.S. Cl. 74—868 **15 Claims**



1. A hydromechanical transmission system for an engine driven-vehicle comprising:

a transmission;

a hydraulic control system;

and fluid pressure means for providing fluid under pressure to the transmission and the control system, the pressure of said fluid under pressure bearing a direct relation to the speed of the vehicle engine;

the transmission further comprising:

an input shaft driven by the engine;

an output shaft driving the vehicle;

a variable displacement hydrostatic pump-motor;

first drive means for selectively connecting the input shaft to the variable displacement hydrostatic pump-motor;

a fixed displacement hydrostatic pump-motor hydraulically coupled to the variable displacement hydrostatic pump-motor allowing the fixed displacement hydrostatic pump motor to act as a motor while the variable displacement hydrostatic pump-motor is acting as a pump, further allowing the fixed displacement hydrostatic pump-motor to act as a pump while the variable displacement hydrostatic pump-motor is acting as a motor;

a recycling planetary group comprising a recycling planetary carrier driven by the input shaft, a first sun gear, a plurality of first planet gears carried by the recycling planetary carrier and in intermeshing relation with the first sun gear, a plurality of second planet gears carried by the recycling planetary carrier overlapping with and in intermeshing relation with the first planet gears, a second sun gear in intermeshing relation with the second planet gears, and a recycling ring gear intermeshing with the second planet gears;

a primary planet carrier drivingly connected to the output shaft;

a first range planetary gear group having a first range sun gear, a plurality of first range planet gears carried by the primary planet carrier and a first range ring gear;

second drive means for drivingly connecting the fixed displacement hydrostatic pump-motor to the first sun gear of the recycling planetary group and to the first range sun gear;

a first range drive engagement means for selectively stopping rotation of the first range ring gear to provide a low range drive ratio;

a third range drive engagement means for selectively engag-

ing the recycling ring gear with the primary carrier to provide an intermediate range drive ratio; and

a fourth range drive engagement means for selectively engaging the second sun gear with the primary carrier to provide a high range drive ratio;

the control system further comprising:

sense means for sensing engine speed;

pedal means for selecting an engine speed;

pump actuator control means responsive to said sense means and said pedal means for varying the reduction ratio of the transmission so that engine speed increases when the selected engine speed is greater than the sensed engine speed, and engine speed decreases when the selected engine speed is less than the sensed engine speed; and,

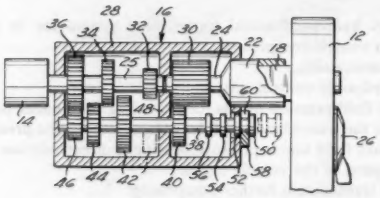
clutch control means responsive to said pump actuator control means for actuating one of the drive engagement means.

4,043,228

SOCKET WRENCH

William R. Venezio, 3078 McDonald Ave., Schenectady, N.Y. 12304

Filed Dec. 2, 1976, Ser. No. 746,960
Int. Cl.[2] B25B *17/00*
U.S. Cl. 81—57.3 **4 Claims**



1. In a socket wrench having a handle to be turned, a rotatable socket, a gear reduction acting between said handle and said socket, and means for selecting one of two or more different gear ratios in said gear reduction to select accordingly the mechanical advantage between said handle and said socket, the improvement wherein said gear reduction and said selecting means comprise:

an output shaft carrying said socket and carrying a plurality of driven gears of different diameters;

an axially adjustable intermediate shaft carrying a corresponding plurality of gears of different diameters which are drivingly engageable individually with corresponding driven gears on the output shaft in different axial positions of said intermediate shaft;

and means for selectively locking said intermediate shaft in said different axial positions while permitting rotation of said intermediate shaft in each of said different axial positons.

4,043,229

SELF-RETRACTING TOOL

Robert M. Ortlieb, Southfield, Mich., assignor to DeVlieg Machine Company, Royal Oak, Mich.

Filed Apr. 5, 1976, Ser. No. 673,642
Int. Cl.[2] B23B *21/00*
U.S. Cl. 82—24 A **29 Claims**

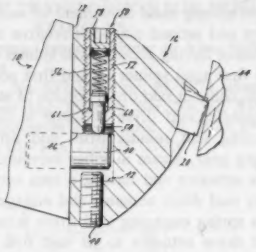
1. A tool holder assembly for mounting a tool on a machine in a predetermined location with respect to a workpiece to perform a machining operation on the workpiece, wherein the portion of the surface of the workpiece being machined and the work performing portion of the tool move relative to one another in a cutting direction and in a feed direction at right angles thereto, the tool holder assembly comprising:

a base member adapted to be affixed to the machine;

a tool holder having means for rigidly mounting the tool thereon;

mounting means for pivotally mounting said tool holder to said base member for pivotal movement of said portion of the tool between first and second positions,

said mounting means being operable to permit movement of said tool portion to said second position in response to the



forces created by the engagement of said tool portion and the surface to be machined,

said second position being spaced from said first position in the direction of movement of the tool with respect to the workpiece in said feed direction; and

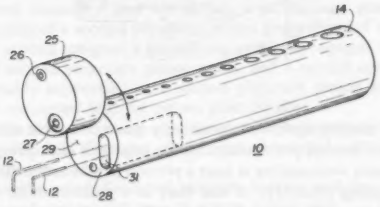
stop means for limiting further pivotal movement of said tool holder when said tool portion moves from said first position to said second position.

4,043,230

ALLEN WRENCH HOLDER

Eugene G. Scrivens, Shaftsbury, Vt., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 665,044
Int. Cl.[2] B25B *13/00*
U.S. Cl. 81—177 A **1 Claim**



1. A holder for retention of hexagonal section L-shaped wrenches comprising

a body member formed with a plurality of parallel through holes, each of a different cross-section from the others, with the center of each hole located substantially along a straight line, with positive fastening means for individual retention in each hole of a hexagonal wrench, in which the positive fastening means comprise a screw mounted in a threaded hole that intersects and is transverse to the axis of the through hole,

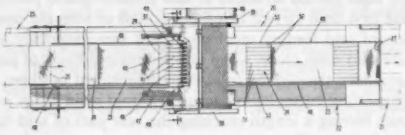
said body member fitted with a shaped internal recess, open at one end of the body member, together with a solid cap mounted by two cap screws to said end so as to serve as a closure for said recess, said cap screws each located a distance from the longtudinal axis of the body member, so that removal of one screw permits the cap to pivot about the other screw so as to uncover said recess, with said recess of non-circular cross-section, and of a length and cross-section to retain a bent L-shaped hexagonal wrench of a size smaller than that accommodated by the through holes of the body.

4,043,231

APPARATUS FOR TRIMMING AND SCORING CUT SOD TO PRODUCE SEPARABLE PLUGS

Herbert L. Friedberg, Baltimore, Md., assignor to The Shelburne Company, Baltimore, Md.

Filed Oct. 14, 1976, Ser. No. 732,522
Int. Cl.[2] B26D *3/08*
U.S. Cl. 83—9 3 Claims



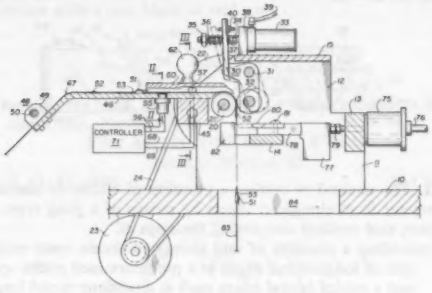
1. Apparatus for trimming and scoring cut sod sections to form attached readily separable plugs thereon comprising linear generally horizontal endless belt conveyor means for cut sod sections which are substantially rectangular and which have an accurately defined width between longitudinal edges and an inaccurate length between ends of the sod sections, the cut sod sections being initially placed on the conveyor means in succession with their longer dimensions transverse to the conveyor means and their narrower and more accurate dimensions longitudinal of the conveyor means, a first scoring and trimming means on the conveyor means intermediate the ends thereof, laterally spaced parallel sod squaring and guidance rails on the conveyor means at the upstream side of said first scoring and trimming means, the first scoring and trimming means comprising a pair of top and bottom superposed rolls, the top roll arranged above the upper run of said endless belt conveyor means and the bottom roll arranged between the upper and lower runs of the belt conveyor means and serving as an idling intermediate support roll for the belt conveyor means, power means coupled with the top roll to drive it, a plurality of axially spaced parallel sod scoring disc blades and a pair of end trimming blades on the top roll turning therewith, a single pair of end trimming blades only on the bottom roll and lying immediately outwardly of the end trimming blades of the top roll, the upper run of the belt conveyor means having its longitudinal edges disposed immediately inwardly of the trimming blades of the bottom roll and beneath the sod scoring blades of the top roll, whereby the cut sod sections on the upper run of the belt conveyor means receive plural parallel lines of scoring and have their opposite ends trimmed to accurate and uniform lengths as they pass between said top and bottom rolls of the first scoring and trimming means, and a second sod scoring means on the linear belt conveyor means downstream from the first scoring and trimming means for scoring the cut sod sections at right angles to said scoring lines produced at said first scoring and trimming means following rotation of the sod sections ninety degrees on the upper run of the belt conveyor means, said second sod scoring means comprising a single transverse axis roll above the upper run of the belt conveyor means, an opposing solid bed plate immediately below and supporting said upper run, power means coupled with said single transverse axis roll to drive it, and a plurality of axially spaced parallel sod scoring disc blades on the single transverse axis roll whereby the cut sod sections moving with said upper run receive plural parallel lines of scoring while passing through said second sod scoring means to thereby complete the formation of multiple rectangular plugs on each cut sod section which are uniformly sized and easily separable for usage.

4,043,232

AUTOMATIC CUTTING MACHINE FOR CONTINUOUS TAPES

Eudor Louis Jovin, Newport News, Va., assignor to Coats & Clark, Inc., Stamford, Conn.

Filed Aug. 19, 1976, Ser. No. 715,843
Int. Cl.[2] B26D *5/28, 5/30*
U.S. Cl. 83—13 12 Claims



1. An apparatus for cutting continuous tapes having distinguishable locations of first and second types regularly appearing thereon, comprising cutter means, control means for operating said cutter means, means for advancing said tape toward said cutter means at a determinable rate, first detecting means positioned to detect the passage of a location of said first type passed a first given position, second detecting means positioned to detect the passage of a location of the second type passed a second given position, first delay means responsive to detection of a location of said first type for enabling detection of a location of said second type for a second determined time period, and second delay means responsive to the detection of a location of said second type within said first determined period for energizing said control means a second predetermined time period after the detection of said location of said second type.

11. A method for cutting zippers to a determined length from a continuous length of meshed adjacent chains of common zipper tape having bottom stops and sliders regularly positioned thereon, said method comprising directing said common zipper tape to a cutter at a determined rate, detecting passage of a slider at a first position of said cutter, detecting passage of a bottom stop at a second position upstream of said cutter that occurs within a given time following said detection of a slider, and operating said cutter to sever said tape a determined time following said detection of a bottom stop.

4,043,233

METHOD OF PREVENTING MULTI-SHEET FEEDING

Masao Seki; Hidetoshi Kito, and Masaki Yoshino, all of Ebina, Japan, assignors to Rank Xerox Ltd., London, England

Filed Sept. 13, 1976, Ser. No. 722,891
Claims priority, application Japan, Dec. 3, 1975, 50-142842
Int. Cl.[2] B65H *3/00;* B26D *3/02*
U.S. Cl. 83—23 4 Claims

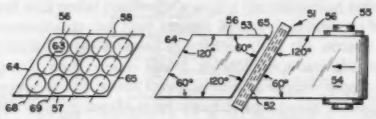
1. A method of preventing double-sheet feeding from a stack of sheets comprising the steps of: (a) cutting the sheets at an incline with respect to the plane of the stack of sheets; and (b) arranging offset ends of the sheets formed from the inclined cutting of the sheets approximately at right angles to the surface of the sheets.

4,043,234

APPARATUS AND METHOD FOR CUTTING CIRCLES FROM SHEET MATERIAL

Victor B. Godin, Reading, and Howard P. Bruck, Westford, both of Mass., assignors to Victor B. Godin, Trustee, Reading, Mass.

Filed Nov. 24, 1976, Ser. No. 744,524
Int. Cl.[2] B26D *9/00*; B26F *1/44*
U.S. Cl. 83—40 **8 Claims**



1. The method of cutting a plurality of circles of identical diameter from elongated sheets by means of a gang type die cutter, said method comprising the steps of

providing a plurality of said elongated sheets, each with a pair of longitudinal edges at a predetermined width apart and a pair of lateral edges each at a predetermined length apart, said predetermined width and length being substantially an exact multiple of the diameter of said circles plus trim, the lateral edges of each said sheet defining an acute angle of about sixty degrees with a longitudinal edge thereof to form the outline of said sheet into parallelogram, trapezoid, or equilateral triangle, configuration;

arranging the circular dies of said gang type die cutter in closely packed, laterally extending rows, juxtaposed successively lengthwise of said cutter, the centres of each successive lateral row of said circular dies being aligned at an acute angle of about sixty degrees from a longitudinal edge of said cutter and the overall width and length of said rows of cutters being substantially an exact multiple of the diameter of said circles plus trim spacing;

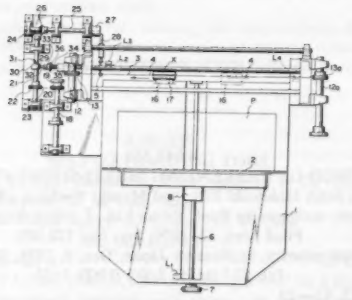
and then individually and successively die cutting lifts of superposed said sheets by means of said cutter to simultaneously form a plurality of circles of identical diameter with minimum waste.

4,043,235

BACK-SPLITTING APPARATUS IN THE PRODUCTION OF BROCHURES

Toshio Miyamoto, Fukuoka, Japan, assignor to Marumiya Shoko Co., Ltd, Fukuoka, Japan

Filed Aug. 30, 1976, Ser. No. 718,558
Int. Cl.[2] B26D *3/12*
U.S. Cl. 83—207 **9 Claims**



1. Back-splitting apparatus in the production of a brochure, comprising:

a feeding mechanism which transfers laminated sheets of paper to a predetermined position, said laminated sheets of paper having front and rear covers arranged for each copy and having back fixation of a thickness corresponding to several copies;

first rotary shafts which are disposed on the right and left at said predetermined position in a manner to be suitably spaced from a rear part surface of said laminated sheets of paper and to have an interval greater than at least a width of said laminated sheets of paper;

first gears which are respectively secured to said first rotary shafts;

a main chain extending over said first gears;

a first limit switch arranged at said predetermined position, said first limit switch being connected to stop the operation of said feeding mechanism and simultaneously activate said main chain when said laminated sheets of paper have been transferred to said predetermined position;

back-splitting cutter knives secured to said main chain, each knife having a length reaching the rear part of said laminated sheets of paper;

a gear mechanism arranged by the side of said rotary shaft;

an open hook reciprocated by the drive of said gear mechanism so as to separate an end part of said laminated sheets of paper at said predetermined position into a thickness of one copy;

auxiliary chain elements secured to said main chain and meshing with said gear mechanism when said back-splitting cutter knife has moved to the vicinity of one end part of said main chain;

a second limit switch in the vicinity of the other end part of said main chain connected to stop the turning of said main chain and actuate said feeding mechanism when said back-splitting cutter knife has moved from said one end part to said other end part; and

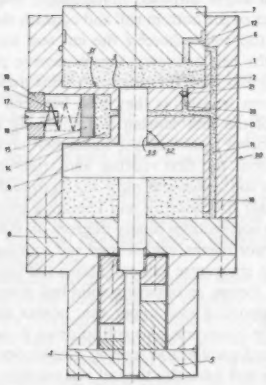
said back-splitting cutter knife being positioned to thrust from the end part of said laminated sheets of paper into said rear part thereof after said open hook has operated.

4,043,236

DEVICE FOR TRANSFORMING A SINGLE PRESSURE FORCE INTO SEPARATE PRESSURE FORCES

Arie de Jong, Zaltbommel, Netherlands, assignor to Perswerk de Jong B.V., Netherlands

Filed Feb. 10, 1976, Ser. No. 656,802
Claims priority, application Netherlands, Feb. 14, 1975, 7501729
Int. Cl.[2] B26D *5/12*; B26F *1/14*
U.S. Cl. 83—137 **6 Claims**



1. In a punching apparatus:

a main body having a first chamber and a second chamber connected by an axial bore, said axial bore opening on an end wall of said first chamber;

a power piston received in said first chamber, and movable toward and away from said end wall;

a piston rod received within said axial bore, and having a retraction piston thereon slidably received within said second chamber;

punch means arranged to be operated by said piston rod upon downward movement thereof, to engage a workpiece;

stripper means carried by said main body on the lower end thereof, and engageable with said workpiece;

means defining a buffer chamber, said buffer chamber containing a slidably mounted buffer piston, and means urging said buffer piston toward one end wall of said buffer chamber;

first passage means connected with the region of said second chamber beneath said retraction piston;

second passage means connecting said first passage means with the region of said buffer chamber beneath said buffer piston;

third passage means connecting said seond passage means with the region of said first chamber beneath said power piston, and including a one-way valve arrangement to permit flow only from said second passage means to said first chamber; and

fourth passage means connecting said first passage means with said first chamber, and including valve means arranged to open only after said power piston has moved a predetermined distance within said first chamber toward said end wall;

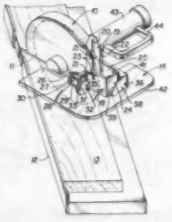
said first chamber beneath said power piston, said second chamber beneath said retraction piston, said buffer chamber beneath said buffer piston, and said passages being arranged to receive an operating fluid, whereby when pressure is initially placed on said power piston to move said power piston toward said end wall of said first chamber said punch means and said stripper means will be engaged with said workpiece with separate pressure forces that are directly dependent on each other and on the strength of said workpiece, said valve means of said fourth passage means opening in response to further movement of said power piston occurring after said punch means penetrates said workpiece to operate said retraction piston for retracting said punch means while said stripper means remains engaged with said workpiece.

4,043,237

GUARD FOR RADIAL ARM SAW

Stoddard H. Pyle, Corvallis, Oreg., assignor to Wayne R. Roberts, Corvallis, Oreg., a part interest

Filed Nov. 9, 1976, Ser. No. 740,309
Int. Cl.[2] B27B *5/20*; B27G *19/04*
U.S. Cl. 83—478 **12 Claims**



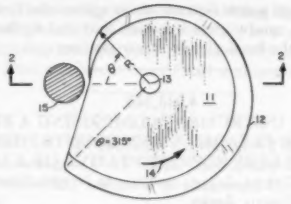
1. A guard for a radial arm saw or the like comprising a mounting bracket, means adjustably attaching the mounting bracket to an existing upper guard or to a member moving with the upper guard on a radial arm saw whereby the mounting bracket can be vertically adjusted relative to said upper guard, an awareness guard in the form of a perimeter member projecting forwardly of and beyond opposite sides of the saw blade of a radial arm saw, the area encompassed by said perimeter member formed substantially or material through which an object being sawed can be visually observed by a sawyer, a bracket carrying the awareness guard and being pivotally attached to the mounting bracket, whereby the awareness guard may be tilted relative to the mounting bracket and also raised and lowered bodily therewith, and a tilt shield secured to the awareness guard and movable therewith and serving to cover a gap which develops when the awareness guard is tilted relative to said upper guard thereby protecting a sawyer from contact with a saw blade at said gap.

4,043,238

CABLE CUTTER

Ernest E. van Ham, Lyndeboro, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Apr. 21, 1976, Ser. No. 678,806
Int. Cl.[2] B26D *4/42*
U.S. Cl. 83—595 **18 Claims**



1. A cutting implement, comprising, a frame, said frame including means for defining a work support at a predetermined location at which a work piece to be cut is positioned during the cutting operation,

a plate having a curved sharpened edge and mounted on said frame for rotation about an axis,

said plate being shaped and said axis being positioned relative to said work support so that as said plate is rotated said edge traverses said location,

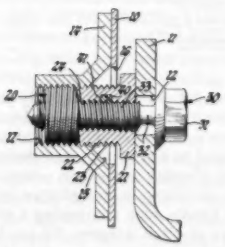
characterized in that said plate also is shaped so that the rate of advance of said edge through said location as a function of the angle of rotation of said plate decreases as the angle of rotation increases.

4,043,239

SHIM NUT AND SCREW BOLT ASSEMBLY

Ernest L. DeFusco, Clawson, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 16, 1976, Ser. No. 649,791
Int. Cl.[2] F16B *35/00*
U.S. Cl. 85—1 R **4 Claims**



1. A shim nut and fastener device for retaining a first member having an aperture therein to a second member having an internally threaded aperture means therein extending from the surface thereof next adjacent the first member, with the first

member being retained in spaced apart relation to the second member by said shim nut and fastener device; said shim nut and fastener device including a shim nut of tubular configuration having an end surface facing said first member and having external threads thereon in rotatable, substantially fully, threaded engagement with the internally threaded aperture means of the second member and having internal threads of an opposite pitch to said external threads extending through said shim nut, said shim nut being threadedly engaged in said internally threaded aperture means so as to initially have said end surface spaced from said first member; and a screw fastener having a head with an externally threaded shank extending therefrom inserted through the aperture of the first member into threaded engagement with said internal threads in said shim nut; self-locking means operatively associated with said threaded shank and with said internal threads in said shim nut whereby as said screw fastener is driven into said shim nut, said shim nut is caused to back out of the internally threaded aperture means of the second member whereby said end surface is brought into abutment against the first member after which the screw fastener can be further threaded into said shim nut until said head of said screw fastener abuts against the first member which is then sandwiched between said end surface of said shim nut and the head of said screw fastener.

4,043,240

ELECTRIC INSTRUMENT COMPRISING A BINARY COUNTER CLEARED WHEN COUNTS THEREIN REACH INTEGERS REPRESENTATIVE OF A MELODY

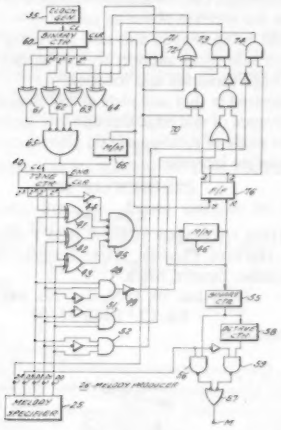
Fumio Ando, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed June 18, 1976, Ser. No. 697,398

Claims priority, application Japan, June 23, 1975, 50-77216; June 23, 1975, 50-77217

Int. Cl.[2] G10H *5/06*

U.S. Cl. 84—1.01 **6 Claims**



1. An instrument for electrically digitally producing a melody comprising musical sounds of a musical scale consisting of a plurality of tones within an octave, said tones having fundamental periods equal to a predetermined period multiplied by tone integers, said plurality in number, which comprises:

first means for producing, in compliance with said melody, pitch binary signals, each comprising a plurality of digits representative of pitch integers, the pitch integers being related to said tone integers to specify said musical sounds;

a tone clock generator for producing a train of tone clock pulses of a tone clock period equal to a rational multiple of said predetermined period;

second means responsive to said clock pulses and binary signals for producing electric pulse groups, the electric pulses in said pulse groups having repetition periods equal to said predetermined period multiplied by the tone integers to which the pitch integers said binary signals are representative of are related;

third means responsive to said pulse groups for producing said melody;

said second means further comprising controllable frequency divider means responsive to said clock pulses and binary signals for producing said electric pulses by successively multiplying said clock period by the tone integers to which the pitch integers said binary signals are representative of are related;

said tone integers comprising at least two first tone integers and at least one second tone integer, said first tone intergers being equal to a common measure multipled by integral factors, said second tone integer being equal to the algebraic sum of said common measure multiplied by an integral factor for said second tone integer plus a correction not greater in absolute value than about one-tenth of said second tone integer, said pitch binary signals comprising first and second binary signals, the pitch integers of said first binary signals being first pitch integers equal to the integral factors for said first tone integers, the pitch integers of said second binary signals being second pitch integers equal to said integral factor for said second tone integer, wherein said frequency divider means comprises:

a controllable binary counter responsive to tone pulses for successively producing tone count signals representative of counts of said tone pulses;

fourth means responsive to said clock and electric pulses and first and second binary signals for supplying said tone pulses to said binary counter;

means responsive to said electric pulses for clearing said binary counter; and

tone logic means responsive to said count and first and second binary signals for producing said electric pulses every time when the counts said count signals are representative of reach the integral factors which the plurality of digits of said first and second binary signals are representative of.

4,043,241

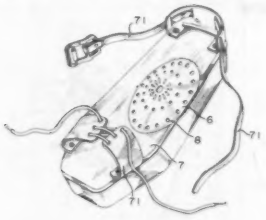
MUSICAL SHOE

Hsing-Ching Liu, 213, 3rd Floor, Section 4, Chung Ching North Road, Taipei, China /Taiwan

Filed Aug. 2, 1976, Ser. No. 710,381

Int. Cl.[2] G10H *1/00, 5/04*

U.S. Cl. 84—1.01 **5 Claims**

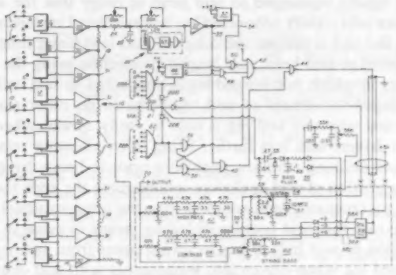


1. A musical shoe for children comprised of a separable upper and lower half, the upper half being flat and provided with straps for the purpose of securing the shoe to the foot and having a plurality of holes and a speaker provided thereunder; said lower half having a base portion and at least four inclining sides, said lower half also being hollow and provided internally with an electronic circuit including a power source, a plurality of switches which when closed cause the electronic circuit to produce various musical tones which are emitted from said speaker, and an on-off/volume control switch.

4,043,242
CIRCUIT FOR MUSICAL INSTRUMENT

Raymond A. Cavicchio, Rte. No. 1, Box 313, Sunapee, N.H. 03782

Filed Dec. 10, 1975, Ser. No. 639,460
Int. Cl.[2] G10H *1/00, 3/06*
U.S. Cl. 84—1.17 11 Claims



1. An electronic device for use with a musical instrument having bass buttons for simulating a bass string instrument comprising;

a plurality of switch means each operatively associated with a botton and responsive to actuation of its associated button,

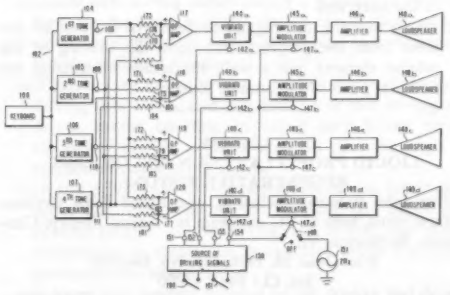
means coupled from said plurality of switches for establishing a first octave audio signal of a frequency corresponding to the note played, and a second octave audio signal of a frequency corresponding to a note an octave adjacent the one played,

and logic means including first means responsive to the playing of notes of a first field of the octave, second means responsive to the playing of notes of a second field of the octave, and alternating means responsive to a note being played in said first field for passing in one state the first octave audio signal and in another state the second octave audio signal.

4,043,243
ELECTRONIC CHORUS AND TREMULANT SYSTEM

Richard H. Peterson, 11748 Walnut Ridge Drive, Palos Park, Ill. 60464

Continuation-in-part of Ser. No. 406,411, Oct. 15, 1973, Pat. No. 3,886,835, which is a continuation of Ser. No. 44,276, June 8, 1970, abandoned. This application Jan. 22, 1975, Ser. No. 543,095
The portion of the term of this patent subsequent to Feb. 18, 1992, has been disclaimed.
Int. Cl.[2] G10H *1/04*
U.S. Cl. 84—1.25 16 Claims



1. A tremulant system for electrical musical instruments comprising:

a plurality of tone generators each capable of producing at least some of the notes of a musical scale;

n transmission channels each having an input and an output;

a plurality of loudspeakers connected respectively to the outputs of said transmission channels;

n vibrato units each connected between the input and output terminals of a respective one of said transmission channels;

each vibrato unit having a control terminal;

means for causing each of said vibrato units to modulate signals applied to its respective channel in response to a driving signal applied to its control terminal;

n driving signals applied respectively to said control terminals;

said driving signals having phase relationships that differ by approximately $360°/n$;

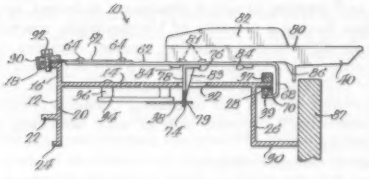
first matrixing means for combining signals from each of said plurality of tone generators in one phase relationship and applying said matrixed signals to at least one of said *n* channels;

and second matrixing means for combining signals from each of said plurality of tone generators in a different phase relationship and applying said differently matrixed signals to at least a different one of said *n* channels.

4,043,244
ELECTRONIC MUSICAL INSTRUMENT KEYBOARD

Ray B. Schrecongost, Park Ridge, and Edward J. Perutis, Chicago, both of Ill., assignors to Hammond Corporation, Chicago, Ill.

Continuation of Ser. No. 476,971, June 6, 1974, abandoned, which is a continuation of Ser. No. 339,628, March 12, 1973, abandoned. This application Dec. 13, 1974, Ser. No. 532,427
Int. Cl.[2] G10C *3/12*
U.S. Cl. 84—423 10 Claims



1. A key cluster for a musical instrument keyboard comprising a thin sheet of resilient material slit to define a plurality of spaced, parallel, relatively wide spring fingers, said fingers having black and white keys secured thereto to extend axially therefrom in chromatic order, the spring fingers associated with the black keys being formed with a smaller cross section over at least a portion of their length relative to that of the spring fingers associated with the white keys to equalize operating pressure as between the white and black keys, and means associated with each key for operating a switch.

8. A musical instrument keyboard assembly including means providing a mounting rail, a key cluster comprising a thin sheet of resilient material having slits extending from one edge toward the opposite edge thereof to define parallel, spaced, relatively wide spring fingers, black and white playing keys arranged in chromatic order mounted to each of said fingers to extend axially therefrom, said opposite edge of said sheet being secured rigidly against said rail, a flange extending from said mounting rail generally perpendicular to said fingers of said key cluster and having thereon a rib extending opposite said rail and situated under said fingers at about the line of maximum deflection thereof, and means associated with each key for controlling a signal source.

9. A musical instrument keyboard assembly including a keyboard frame having a rail generally inclined upwardly with respect to said frame, said rail having a transversely convex upper surface, a key cluster comprising a thin sheet of resilient material having slits extending from one edge toward the

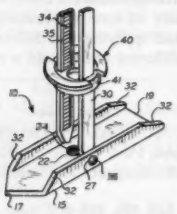
opposite edge thereof to define parallel spaced relatively wide spring fingers, black and white playing keys arranged in chromatic order mounted to consecutive ones of said fingers to extend axially therefrom, said opposite edge of said sheet being secured rigidly against said convex surface by a clamping member for urging said keys upwardly, said clamping member having a surface complementary to said convex rail surface and being transversely adjustable with respect to said rail surface, and interengaging means on said keys and said frame to limit resilient restoration of said keys.

4,043,245

ANCHORING DEVICE

Stanley Kaplan, Universal Fastenings, 180 Marine St., Farmingdale, N.Y. 11735

Filed Feb. 6, 1976, Ser. No. 655,824
Int. Cl.[2] F16B *37/04*
U.S. Cl. 85—3 R **10 Claims**



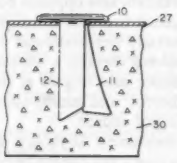
1. An anchoring device providing engaging means for an attaching member, said device comprising:
   an elongate toggle plate dimensioned to fit into an opening in a wall member to which attachment is desired, said toggle plate having a plurality of longitudinally spaced, differently dimensioned attaching member engaging openings therein which are threaded, and a pair of bearing openings for each attaching member engaging openings, one of the openings of each pair of bearing openings lying on each diametrically opposed side of each attaching member opening;
   a pair of elongate runners;
   means for selectively coupling each one of said pair of runners to the bearing openings on the side of any selected attaching member openings; and
   a washer having two spaced slide openings, one for each runner through which said runners pass, said washer having an attaching member opening between said runners.

4,043,246

SHEET METAL NAIL FOR SECURING COVERINGS TO CEMENTITIOUS MATERIALS

John L. Wright, Albuquerque, N. Mex., assignor to W. R. Grace & Co., Cambridge, Mass.

Filed Oct. 22, 1976, Ser. No. 734,894
Int. Cl.[2] E01B *9/12*
U.S. Cl. 85—11 **6 Claims**



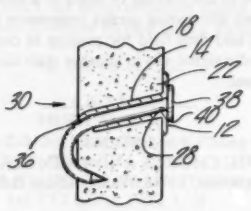
1. An improved sheet metal nail for attaching a covering material to a cementitious construction material, said nail comprising a generally flat planar head and an elongated hollow shank depending from said head at substantially a right angle thereto, said shank being narrower than said head and having a penetrating end remote from said head, said shank being comprised of a pair of legs, each said leg being substantially channel-shaped in transverse cross-section, one of said legs being rigidly connected to said head in order that the angle between said rigidly connected leg and said head is maintained when the nail is driven, the other of said legs being hingedly connected to said head, said hinged connection being the only manner in which said hinged leg is connected to said nail and the hinged movement of said leg being in no other manner restricted whereby said leg is able to easily spread when the nail is driven, said legs further being in overlapping relationship and defining a hollow enclosure prior to being driven, at least a portion of said enclosure intermediate the ends thereof having a cross-sectional area less than the cross-sectional area at said one end, said portion including means to cause at least a portion of said hinged leg to spread apart from said rigidly attached leg when driven into engagement with said cementitious construction material while other portions of said legs remain in overlapping relationship, whereby a plug of the construction material is retained between the spread apart legs which maintains them in spread position in order to increase the resistance to withdrawal of the nail from the said construction material.

4,043,247

WALL FASTENER

Anthony S. Rowinski, Bloomfield Hills, Mich., assignor to U.S. Engineering Company, Inc., Muncie, Ind.

Filed Nov. 28, 1975, Ser. No. 636,060
Int. Cl.[2] F16B *15/00*
U.S. Cl. 85—31 **6 Claims**



1. An anchor, comprising:
   a. a driving surface,
   b. a tubular element having an inlet and an outlet, the tubular element extending outwardly from the driving surface, the free end of the tubular element having an arcuate section such that the outlet is substantially perpendicular to the inlet, and
   c. means to cause the angular deviation of the tubular element from the perpendicular upon the driving of the tubular element into a wall, the means comprising the terminal point of the arcuate section.

4,043,248

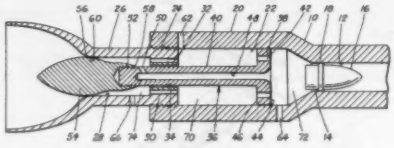
LIQUID PROPELLANT GUN (RECOILLESS REGENERATIVE PISTON)

Melvin John Bulman, Shelburne, and Alfred Rapp Graham, Burnt Hills, both of Vt., assignors to General Electric Company, Burlington, Vt.

Filed June 10, 1976, Ser. No. 694,870
Int. Cl.[2] F41F *15/00*
U.S. Cl. 89—1.703 **14 Claims**

1. A gun comprising:
   a gun barrel;

a combustion chamber;
a liquid propellant supply chamber;
first means having a displacement which is a time function for injecting propellant from said supply chamber into said combustion chamber as a function of said displacement;



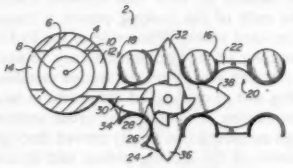
a balancing nozzle having a throat
valve means communicating between said combustion chamber and said balancing nozzle throat for providing a conduit for the flow of combustion gas, and coupled to said first means for controlling said flow as a function of said displacement of said first means.

4,043,249

AMMUNITION CONVEYOR DRIVE CAM

John G. Rocha, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 6, 1976, Ser. No. 702,542
Int. Cl.[2] F41D 9/02
U.S. Cl. 89—33 CA 7 Claims



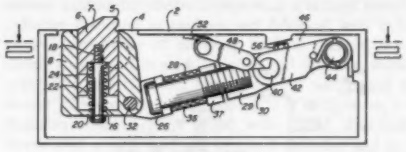
1. An ammunition feed conveyor drive assembly for automatic weapon systems including rotatable feed means for sequentially feeding rounds laterally and individually into a receiver opening of the weapon,
rotatable driven cam means for rotating said rotatable feed means and having a plurality of cam surfaces, and
rotatable cam driving means having a plurality of cam surfaces for engagement with selected cam surfaces of said driven cam means to rotate said driven cam means and thereby said feed means,
said driven cam means having a smaller diameter than said driving cam means, said cam surfaces of said driving and driven means coacting to rotate said driven means through a smaller angle of rotation than the angle of rotation of said driving means,
both said driving and driven cam means having interrupted upper and lower cam bearing surfaces, said upper cam bearing surfaces of the driving and driven cam means cooperating to rotate said driven cam means through a predetermined angle,
said lower cam bearing surfaces of the driving and driven means cooperating to rotate said driven means through a predetermined angle.

4,043,250

RECOILABLE GUN TUBE LATCH

Harold Herman Wiese, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 28, 1976, Ser. No. 700,643
Int. Cl.[2] F41F 19/16
U.S. Cl. 89—170 3 Claims

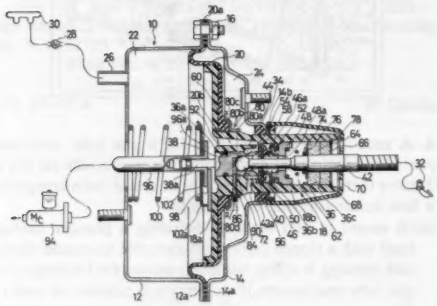


1. A recoilable gun tube latch for a gun tube mechanism mounted for reciprocal movement on a gun cradle on fire out of battery (soft recoil) artillery weapons, said latch comprising:
a first housing having an opening,
latch means in said housing including a plunger having a head with a sloped surface positionable to extend through said opening in a first latching position for latching of said gun tube mechanism in its rearward position on said cradle,
a pivotable plunger housing for said plunger located in said first housing,
release means for actuating said plunger said plunger housing to permit movement of said plunger and plunger housing from said first plunger latching position,
said release means including means for pivoting said plunger housing and said plunger from said first latching position to a second nonlatching position in said first housing,
means for resetting said release means to return said plunger housing and plunger to said first latching position in said opening after said gun tube mechanism has passed said opening in movement in a counterrecoil direction, and
means for biasing said plunger head from said second housing through said opening into said first latching position in the path of movement of said gun tube mechanism for engagement with and to latch said gun tube mechanism, said biasing means, when said plunger has returned to its latching position, being responsive to contact said gun tube mechanism with the head of said plunger during movement of said gun tube mechanism in a recoil direction to depress said plunger head into said plunger housing and thereby to permit said gun tube mechanism to pass the opening to complete movement in said recoil direction,
said means for pivoting said plunger including an articulated toggle assembly of a plurality of movable links, a first link being pivotally connected to said second housing and a second link having a pivot connection to said first link and to said first housing, a third link movably connected to said first housing and to said pivot connection between said first and second links, said third link being movably responsive to release means to collapse said links to permit pivotal movement of said plunger and plunger housing from said latching position to said unlatching position,
said resetting means including spring means acting on said second link adjacent the connection of the second link to said first housing to return and hold the toggle links in their uncollapsed position whereby the plunger and plunger housing are returned to said latching position,
said plunger including a recess and said biasing means including a shaft bottomed on said second housing at one end and engaging the plunger at its other end and a spring circumscribing said shaft for biasing of said plunger head from said second housing.

4,043,251
SERVOMOTOR

Atushi Ohmi, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 12, 1976, Ser. No. 666,424
Claims priority, application Japan, Mar. 14, 1975, 50-35299[U]
Int. Cl.[2] F15B 9/10; F01B 19/00; F16J 3/02
U.S. Cl. 91—376 R 5 Claims



1. In a servomotor, the improvement comprising:

a. a housing;

b. an annular diaphragm having its outer periphery sealingly attached to said housing;

c. power piston means axially movable within said housing and having

i. a boss axially extending through said annular diaphragm, said boss including a bore and an opening radially-extending from said bore to the outer periphery of said boss adjacent said diaphragm; and

ii. an external flange extending radially from the outer periphery of said axially extending boss for positioning adjacent said diaphragm; and wherein said annular diaphragm and said power means form first and second pressure chambers in said housing;

d. valve means for regulating pressure in said first and second pressure chambers, said valve means including a valve member slidably and sealingly disposed in said bore and having an engaging groove in its outer periphery;

e. retaining means for coupling said diaphragm against said flange of said power piston means, said retaining means including

i. an axially extending cylindrical seat in which said boss is tightly positioned, and wherein said seat has a radial opening;

ii. an external flange radially extending from said seat for pressing an inner portion of said diaphragm against said flange of said power piston means when said retaining means is in a predetermined coupling position and wherein said radial opening of said seat coincides in a radial direction with said radially extending opening of said boss and said engaging groove of said valve member when said retaining means is in the predetermined coupling position;

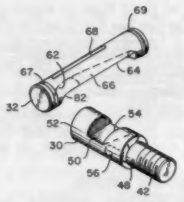
f. pin means positioned in said openings of said retaining means and boss and said engaging groove of said valve member for locking said retaining means in the predetermined coupling position; and

g. means for maintaining said pin means in position.

4,043,252
CYLINDER LOCK STRUCTURE

Walter W. Wawrzyniak, 39230 Gary, Mount Clemens, Mich. 48043

Filed Mar. 1, 1976, Ser. No. 662,350
Int. Cl.[2] F15B 15/26
U.S. Cl. 92—24 11 Claims



1. In combination, a cylinder, a cylinder piston positioned within the cylinder for axial movement therein between a first and a second position, said cylinder piston including a piston rod connected thereto movable axially of the cylinder and a locking structure for releasably locking the piston in its first position, said locking structure comprising a housing, means for securing the housing to the cylinder, said housing having a first opening therethrough axially aligned with the piston rod when the housing is secured to the cylinder, a second opening through said housing extending transversely of the axis of the cylinder, means for passing an actuating medium into and out of the second opening of said housing, a cylindrical wedge member having a transverse slot extending approximately halfway through one side thereof, one side of which is a cam surface inclined with respect to the axis of the cylinder, means for securing the wedge member to the piston rod as an axial extension thereof, means for preventing rotation of said wedge member, a solid, cylindrical locking piston positioned within the transverse opening of said housing means for preventing rotation of said locking piston, said locking piston including a full cylindrical surface on each end thereof, sealing means surrounding the ends of the locking piston, a longitudinally extending and inclined recess in one side of the locking piston including a camming surface complementary to and engageable with the camming surface on the wedge member, a transversely extending slot at one end of the recess in said locking piston, said slot having a semicircular cross section for enabling the wedge member to be axially moved through the slot in one end position of the locking piston, said locking piston camming surface engaging the wedge member camming surface in another end position of the locking piston for preventing movement of said wedge member when in the first position, said axially extending and inclined cam surface on said locking piston extending transversely of the locking piston a distance approximately equal to the radius of the locking piston.

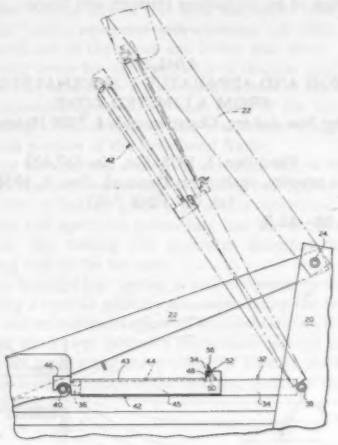
4,043,253
BOOM CYLINDER STOP FOR THE LIFT CYLINDERS OF A SKID STEER VEHICLE

Larry E. Albright, and Dan A. Frederick, both of Gwinner, N. Dak., assignors to Clark Equipment Company, Buchanan, Mich.

Filed July 2, 1976, Ser. No. 701,939
Int. Cl.[2] F15B 15/26
U.S. Cl. 92—25 4 Claims

1. For an extensible hydraulic cylinder, a stop member for retaining the cylinder in an extended position comprising a tubular body portion receivable on the cylinder body of the hydraulic cylinder, a first end portion of the stop having means engageable with the rod end of the hydraulic cylinder and a second end portion of the stop comprising means engageable with the forward end of the cylinder body, the second end portion including an outwardly extending projection having

means for disengaging the stop pivotally mounted thereon, said means operable to release the stop from an interference rela-



tionship between the rod end of the cylinder and the cylinder body when the cylinder is retracted.

4,043,254

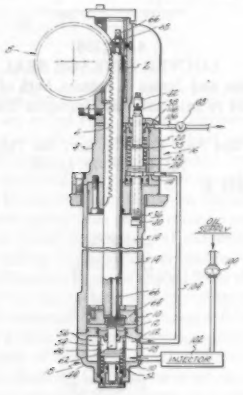
APPARATUS FOR CUSHIONING THE MOTION OF A RECIPROCATING MEMBER

Eginhard Jaeger, Oetwil an der Limmat, Switzerland, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Dec. 3, 1974, Ser. No. 529,208

Int. Cl.[2] F01B *11/02*

U.S. Cl. 92—85 B **7 Claims**



1. In a glassware forming machine, apparatus for hydraulically cushioning the motion of reciprocating means in both directions, comprising:

means for reciprocating the reciprocating means;

first hydraulic cushioning means disposed to be contactable by the reciprocating means to cushion the motion of the reciprocating means in one direction, said first cushioning means comprising a first housing, a cylinder disposed in said first housing, said cylinder having a plurality of metering orifices therein, a piston slidably disposed in said cylinder and forming with said cylinder a first chamber on one side of said piston and second chamber on the opposite side of said piston, a third chamber adapted to be filled with liquid, disposed between said first housing and said cylinder and in fluid communication with said first and second chambers, said piston adapted to be contacted by the reciprocating means near the end of the stroke of the reciprocating means in the direction of said first cushioning means;

second hydraulic cushioning means disposed to be contactable by the reciprocating means to cushion the motion of the reciprocating means in the opposite direction, said second cushioning means comprising a second housing, a cylinder disposed in said second housing, said cylinder having a plurality of metering orifices therein, a piston slidably disposed in said cylinder and forming with said cylinder a first chamber on one side of said piston and a second chamber on the opposite side of said piston, a third chamber adapted to be filled with liquid, disposed between said second housing and said cylinder and in fluid communication with said first and second chambers, said piston adapted to be contacted by the reciprocating means near the end of the stroke of the reciprocating means in the direction of said second cushioning means;

said metering orifices of said first and second hydraulic cushioning means each having a diameter which is greater than the dimension of the orifices in the direction of the flow of fluid therethrough, whereby said first and second hydraulic cushioning means each provide a cushion with substantially constant deceleration of the reciprocating means and which is independent of the viscosity of said liquid; and

means for adjusting the position at which the reciprocating means contacts at least one of said first and second hydraulic cushioning means.

4,043,255

CAM FOLLOWER PISTON

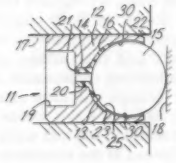
Sinclair Upton Cunningham, East Kilbride, Glasgow, Scotland, assignor to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 358,543, May 9, 1973, abandoned, which is a division of Ser. No. 177,266, Sept. 2, 1971, Pat. No. 3,783,748. This application July 22, 1975, Ser. No. 597,984

Claims priority, application United Kingdom, Sept. 2, 1970, 42010/70

Int. Cl.[2] F16J *1/08, 1/10*

U.S. Cl. 92—158 **1 Claim**



1. A piston for a hydrostatic machine comprising:

a freely rotating cam follower ball for following a cam surface in a hydrostatic machine by reciprocatory motion of said cam follower ball in a cylinder bore of the machine,

a piston body for reciprocatory travel along a cylinder bore, said piston body having at one end a working face to be acted on by the working fluid of a hydrostatic machine, and at the other end a bowl-shaped seating for said ball, said piston body exposing a portion of said ball protruding from said piston body to engage a cam surface, said piston body having an aperture extending from said seating to said working face of said piston body,

an insert of low-friction synthetic plastics material positioned between said cam follower ball and said seating in

a position at the rear of said ball to accept the bearing load of said ball when engaging a cam surface, said insert having an internal bearing surface for said ball and an external surface mating with and supported by said seating, said insert having an extension which extends into said aperture in said piston body and locates said insert in said piston body, said insert having an aperture extending from said bearing surface through said extension of said insert to said working face of said piston body to allow passage of working fluid to said bearing surface for lubrication purposes and for providing hydrostatic support for said cam follower ball,

said piston body encompassing said ball by a portion of said piston body which extends from said seating beyond the centre plane of the cam follower ball, said piston body having a lip extending around the entire perimeter of said bowl-shaped seating and projecting inwardly towards said cam follower ball for engaging said synthetic plastics insert.

4,043,256

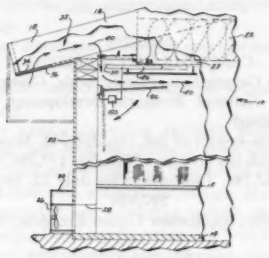
ANIMAL ENCLOSURE WITH PRESSURE CONTROLLED VENTILATION INLET AND DEFLECTION MEANS

Robert L. Van Huis, Zeeland, Mich., assignor to U.S. Industries, Inc., Zeeland, Mich.

Division of Ser. No. 449,625, March 11, 1974, Pat. No. 3,938,428, which is a continuation-in-part of Ser. No. 308,692, Nov. 22, 1972, Pat. No. 3,808,960. This application Oct. 14, 1975, Ser. No. 621,675

Int. Cl.[2] F24F *11/04*

U.S. Cl. 98—1.5 **8 Claims**



1. A ventilation system for a livestock house having spaced side walls, spaced end walls, a floor and ceiling and livestock cage means elevated above the floor comprising in combination: exhaust fans positioned for removing air from said house and drawing it through said cage means; an inlet duct above said cage means for admitting replacement air into said house and drawing said air through said cage means, said inlet duct including an opening defining a slot means extending lengthwise of at least one of said side and end walls of said house, said slot means being positioned at the transition of said ceiling and said one of said side and end walls; louver means adjacent said slot means and movable between a generally open and closed position to generally permit or block air flow through said opening, said louver means including deflection means adjustable relative said slot means for varying the direction of air flowing into said house; means supporting said louver means in front of said slot means, said louver means including an upper and lower margin, said lower margin being supported along said one of said side and end walls and being pivotal about said lower margin whereby said upper margin is movable into and out of abutment with said transition of said ceiling to vary the amount of air flow opening through said slot means providing automatic adjustment of the deflection of air flow into said house relative to the size of air flow opening; sensing means for sensing the pressure differential between the inside and outside of said house; and actuating means responsive to changes in said pressure differential to open or close said louver means and adjust said deflection means to maintain a preselected constant pressure differential and provide continuous and even distribution of air circulation through said house.

4,043,257

METHOD AND APPARATUS FOR EXHAUSTING AIR FROM A LIMITED ZONE

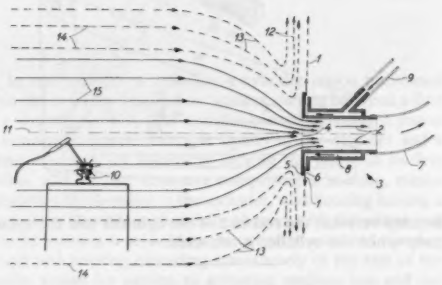
Carl Peter Noe Aaberg, Christiansgade 1, 7500 Holstebro, Denmark

Filed Dec. 3, 1975, Ser. No. 637,402

Claims priority, application Denmark, Dec. 4, 1974, 6301/74

Int. Cl.[2] F24F *7/00*

U.S. Cl. 98—43 R **5 Claims**



1. A method for exhausting fluid from a limited zone around an axis extending into an open space at right angles from the plane of an exhaust opening comprising:

sucking fluid from an open space through an unobstructed exhaust opening facing said space and

simultaneously injecting a circumferentially extending flow of fluid into the open space radially outward from a source surrounding and adjacent to the exhaust opening.

4,043,258

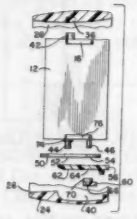
LOUVER LINKAGE SEAL

Ronald F. Zitko, and James R. Adams, both of Downers Grove, Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Aug. 19, 1976, Ser. No. 715,789

Int. Cl.[2] F24F *13/08*

U.S. Cl. 98—121 A **1 Claim**



1. An adjustable air distribution vent for use in directing a stream of air comprising:

a peripheral frame comprising a top portion, a bottom portion, and a pair of end wall portions, the top portion being provided with a plurality of blind holes opening towards the bottom portion and the botom portion equipped with a transverse trough opening towards the top portion of the peripheral frame;

a plurality of louvers having a protruding upper stub axle at

the top portion thereof capable of being received by the blind holes of the top portion of the peripheral frame and a protruding lower stub axle at the lower portion thereof on the vertical axis in line with the upper stub axle, the louver further equipped with a linking rod offset from the vertical axis of the upper and lower stub axles;

a retaining cover having a plurality of circular apertures and a plurality of arcuate linkage guides, the circular apertures accommodating the lower stub axles of the louvers, the retaining cover bridging the transverse trough of the bottom portion of the peripheral frame;

a linkage bar residing a transverse trough below the retaining cover with a plurality of linking rod apertures and a plurality of linkage guide protrusions concentric with the linking rod apertures protruding into the arcuate linkage guides, the linking rod apertures accommodating the linking rod of the louvers;

a louver linkage seal having a pair of apertures therein including a central aperture accommodating the lower stub axle and an outboard aperture accommodating the linking rod of the louver whereby the arcuate linkage guides are covered preventing the passage of foreign material into the transverse trough of the bottom portion of the peripheral frame.

4,043,259

APPARATUS FOR CONTINUOUSLY ROLLING UP SHEETS OF BAKED COOKIES

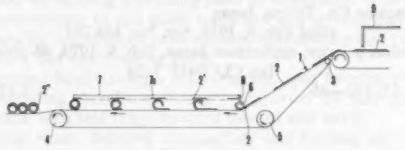
Fumio Sato, Zama, Japan, assignor to Morinaga & Co., Ltd., Japan

Filed July 12, 1976, Ser. No. 704,552

Claims priority, application Japan, July 19, 1975, 50-88955; May 19, 1976, 51-58429

Int. Cl.[2] A23L *3/00*

U.S. Cl. 99—353 **14 Claims**



1. An apparatus for forming rolled sheet articles, such as cookies, which are rolled after heating, comprising an endless conveyor having a surface on which a sheet article thereon is continuously advanced at a predetermined speed, a roll-up roller rotatably mounted alongside a portion of said conveyor spaced less than the sheet article thickness therefrom and being rotated at a slower speed than said surface so as to engage the sheet article and cause the bending of the article around the surface of the roll-up roller, stopper means overlying said roll-up roller surface at a location spaced from the sheet article material contact on the surface of said roll-up roller to cause the sheet article material to be discharged from said roll-up roller, and sheet article rotation means engageable with respective opposite sides of said roller and effective to move the opposite sides at distinct speeds so as to produce a rotational couple thereon to continue the rolling up of the sheet article material.

4,043,260

OPEN-FIRE ROTISSERIE STAND

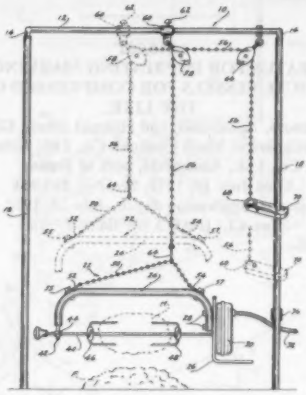
Robert H. LaPour, 6000 5-Mile Road, Racine, Wis. 53402, and Harold G. Liefbroer, 4717 Graceland Blvd., Racine, Wis. 53406

Filed June 11, 1976, Ser. No. 695,015

Int. Cl.[2] A47J *37/04*

U.S. Cl. 99—421 HH **2 Claims**

1. A means of supporting a rotisserie over a fire, said rotisserie having a beam, said means comprising a horizontal bar supported on downwardly-extending legs, a bail extending longitudinally relative to said beam and having spaced links, one end of said bail secured adjacent to each extremity of said beam, an upwardly-directed flexible member selectively engaged to one of said links, a first rotating member slidably secured to said bar, said flexible member being trained over



said first rotating member, a second rotating member spaced from said first rotating member and secured to said bar, said flexible member being trained over said second rotating member and directed downwardly, a height-adjusting arm axially adjustable on one of said legs, and said downwardly-directed flexible member being secured to said arm.

4,043,261

AUTOMATIC BANDING MACHINE

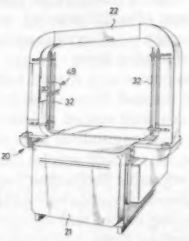
Shinroku Mae, Tokyo, Japan, assignor to Motosuke Umezu, Tokyo, Japan

Filed Aug. 26, 1976, Ser. No. 718,193

Claims priority, application Japan, May 19, 1976, 51-56653

Int. Cl.[2] B65B *13/04*

U.S. Cl. 100—26 **5 Claims**



1. An automatic banding machine for banding a package or the like, comprising a machine base, a band supplying means in said base, an arch on said machine base and projecting therefrom, said arch having a band running channel around the inside periphery thereof opening inwardly of said arch, said band supplying means supplying a band into said band running channel for running the band around said arch and back to said maching base, a band holding means around the inside periphery of said arch and normally covering said channel and movable laterally of said arch for uncovering said channel, driving means coupled to said band holding means for moving said band holding means between the position in which the band holding means covers said channel and the position in which the band holding means leaves said channel uncovered, and an auxiliary band feeder at a position at least halfway around the

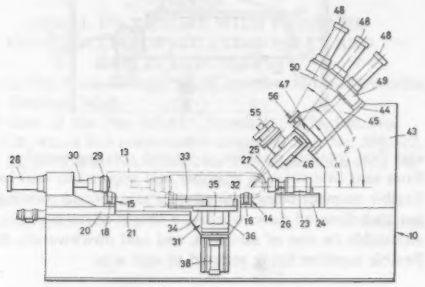
periphery of said arch in the running direction of the band and having a driving roll projecting toward the inside of said arch into said channel and rotating in the band running direction and a press roll on the band holding means opposed to and having the band pressed into contact therewith by said driving roll when said band holding means is in the position for covering said channel.

4,043,262

APPARATUS FOR IMPRINTING MARKINGS ON CYLINDRICAL VESSELS FOR COMPRESSED GASES OR THE LIKE

Isamu Kajimoto, Amagasaki, and Hideaki Morii, Gifu, both of Japan, assignors to Morii Chokoku Co., Ltd., Gifu and Sumikin-Kiko Co., Ltd., Amagasaki, both of Japan

Filed July 14, 1975, Ser. No. 595,964
Claims priority, application Japan, July 15, 1974, 49-80989
Int. Cl.[2] B44B *5/00*; B41F *17/18*
U.S. Cl. 101—7 **5 Claims**



1. An apparatus for engraving markings in a plurality of lines on each of metal cylinder articles for compressed gases, comprising in combination:

a frame having a rearward end and a forward end, said frame having notional lines extending in its transverse direction at constant spacings, said notional lines consisting of a loading line adjacent said rearward end of said frame and comprising a loading platform, an unloading line adjacent said forward end of said frame and comprising an unloading platform, and a plurality of marking lines between said loading and unloading lines;

work rest means comprising spaced rollers arranged at said marking lines on said frame, said articles each having a longitudinal axis, said spaced rollers receiving successive articles with said longitudinal axes of said articles being horizontally disposed, said articles received on said spaced rollers being rotatable about their longitudinal axes;

work transfer means for conveying the successive articles from said loading line to said unloading line through the successive marking lines, said work transfer means comprising a guide means, a carriage slidably mounted on said guide means, work rest elements extending from said guide means, first cylinder-piston means for raising and lowering said guide means between raised and lowered positions such that in said raised position said work rest elements engage said articles to raise the latter from said resting position on said spaced rollers and in said lowered position said work rest elements are disposed at an elevation lower than said articles such that the latter are free to be received on said spaced rollers, and second cylinder-piston means for sliding said carriage relative to said guide means between advanced and retracted positions, said second cylinder-piston means sliding said carriage from said retracted position to said advanced position when said guide means is in said raised position, said second cylinder-piston means sliding said carriage from said advanced to said retracted position when said guide means is in said lowered position;

work holding means for releasably holding the articles on said spaced rollers against longitudinal displacement while permitting the same to rotate about their own longitudinal axes;

marking means arranged over said frame in register with each of said marking lines, said marking means including an arcuate marking surface which has formed thereon a line of indicia to be engraved on the article at each said marking line;

means for moving said marking means back and forth to bring said marking surface into and out of pressure contact with the article rotatably held on each said marking line, said marking means being thus moved in a direction perpendicular to a plane tangent to the article on said marking line at a different point of contact with said marking surface; and

means for rotating said marking surface in rolling contact with the article on each said marking line to engrave the line of indicia thereon, said artical being rotated about its longitudinal axis by said rotating surface;

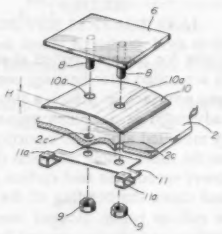
whereby a plurality of lines of indicia are engraved on each article as the same travels through the successive marking lines.

4,043,263

PRINTING MACHINE WITH VERTICALLY SHIFTABLE CREDIT CARD SUPPORTING PLATE

Tetsuo Nakada, Sagamihara, Japan, assignor to Janome Sewing Machine Co., Tokyo, Japan

Filed Feb. 5, 1974, Ser. No. 439,759
Claims priority, application Japan, Feb. 9, 1973, 48-16648
Int. Cl.[2] B41F *3/04*
U.S. Cl. 101—45 **5 Claims**

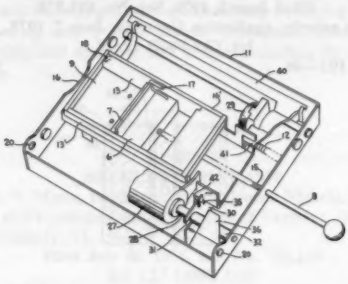


1. A printing machine comprising a printing bed having an upper face and a bottom face; a plurality of selectively settable type wheels projecting in part beyond said upper face of said printing bed; a flat credit card supporting plate having an upper face for supporting a selected one of a plurality of credit cards thereon; a carriage mounted on and movable across said printing bed; a platen roller rotatably carried by said carriage; and means mounting said credit card supporting plate on said printing bed adjustable in vertical direction relative to the latter during a printing operation so that information on the credit card supported on said credit card supporting plate may be properly printed together with types on said type wheels, regardless of the thickness of the credit card used, said mounting means comprising a curved leaf spring substantially of the same outline as said credit card supporting plate and located between said printing bed and said credit card supporting plate.

4,043,264
PRINTING DEVICE

Helmut August Michael Schöttle, and Karl-Heinz Harry Strobel, both of Berlin, Germany, assignors to Adrema Pitney Bowes GmbH, Heppenheim, Bergstrasse, Germany

Filed Jan. 23, 1976, Ser. No. 651,837
Claims priority, application Germany, Jan. 31, 1975, 2504018
Int. Cl.[2] B41F *3/04*
U.S. Cl. 101—269 4 Claims



1. In a portable, manual printer of the type wherein the printing operation is accomplished by a printing plate being impressed upon a print medium such as a sheet of paper or set of forms, the combination comprising:

a housing having an opening therein;

a longitudinally extending guide track received within said housing and having one end adjacent to said opening;

a printing anvil formed within said housing opposite said guide track;

means for holding a printing plate in registration with and intermediate to said guide track and said printing anvil;

means for supporting a print medium intermediate said guide track and said printing anvil;

a printing head having a non-rotatable, apex forming ridge extending therefrom slidingly supported by said guide track with said ridge directed toward said anvil;

biasing means disposed intermediate said housing and said guide track to bias said print head toward said anvil;

a rod secured to said printing head and extending outside said housing;

resilient means disposed about said rod intermediate said printing head and said housing for biasing said printing head toward said opening; and

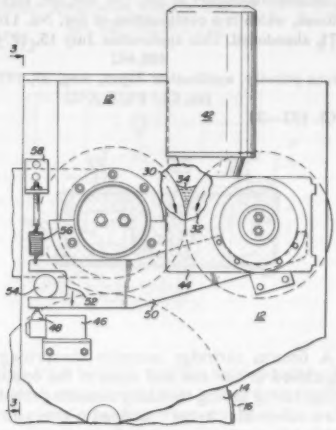
means attached to said printing head for at least partially removing a printing plate from said housing upon completion of the printing operation comprising an engaging member attached to said printing head, means for holding said engaging member away from said printing plate holding means when said printing head is slid by said rod away from said opening and means for placing said engaging member within said printing plate holding means when said resilient means biases said print head toward said opening.

4,043,265
INK LEVEL WARNING SYSTEM

William Grobman, Philadelphia, Pa., assignor to Molins Macine Company, Inc., Camden, N.J.

Filed Jan. 29, 1976, Ser. No. 653,417
Int. Cl.[2] B41F *31/06*
U.S. Cl. 101—350 10 Claims

1. Apparatus comprising a transfer roll, a metering roll generally parallel to said transfer roll and cooperating therewith to define a trough therebetween along the length thereof for receiving a liquid printing medium which acts as a lubricant between contacting peripheral surfaces of said rolls, motor means for rotating said rolls about their axes in opposite directions including a separate drive motor coupled to each of said rolls so that said transfer roll has a surface speed greater than the surface speed of said metering roll, an alarm means, and

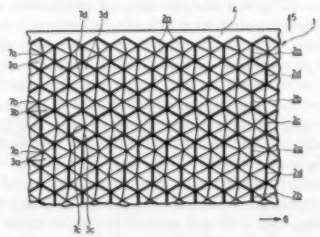


means for triggering said alarm means in response to the reaction torque on the drive motor for said metering roll when the amount of printing medium in said trough is below a predetermined amount.

4,043,266
HOLLOW CHARGE CONSTRUCTION AND METHOD OF FORMING A HOLLOW CHARGE LINING

Manfred Held, Aresing, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Germany

Filed Feb. 23, 1976, Ser. No. 660,178
Claims priority, application Germany, Feb. 26, 1975, 2508270
Int. Cl.[2] F42B *3/08*
U.S. Cl. 102—24 HC 13 Claims



1. A method of forming a hollow charge lining for a hollow charge, comprising forming into a plate a multiplicity of multisided closed-form geometric impressions extending inwardly into said plate from all of the sides of each impression to an innermost geometrical axis point and arranged in longitudinally extending and transversely extending rows, and wherein the impressions of at least some of said rows are formed with geometrical axis points which are offset from the axis points of the other of said rows.

4,043,267

ROCKET BULLET

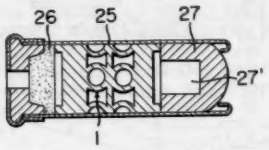
Hisao Hayashi, Tokyo, Japan, assignor to Kabushiki Kaisha Kawaguchiya Hayashi Juho Kayaku-Ten, Tokyo, Japan

Continuation-in-part of Ser. No. 404,200, Oct. 9, 1973, abandoned, which is a continuation of Ser. No. 116,482, Feb. 8, 1971, abandoned. This application July 15, 1974, Ser. No. 488,442

Claims priority, application Japan, Aug. 27, 1970, 45-42393

Int. Cl.[2] F42B *5/02*

U.S. Cl. 102—38 **6 Claims**



1. A firearm cartridge assembly comprising a cartridge casing closed at one end and open at the opposite end, said cartridge casing having an axially extending tubular configuration, a combustible charge contained within said casing at the closed end thereof, a single bullet mounted in and disposed in contact with said casing at the opposite open end thereof in axially spaced relationship with said combustible charge, and an integral wad member contained within said cartridge casing and extending between and in contact with said charge and said bullet, at least a portion of the axially extending lateral surfaces of said wad member being disposed in contact with said casing, said wad member formed of a flexible resilient synthetic resin material and comprising a first end located adjacent said charge and a second end located adjacent said bullet, said first end having a surface in engagement with said charge and said second end having a surface in engagement with said bullet, said charge engaging surface of said first end and said bullet engaging surface of said second end of said wad member each have a recess formed therein spaced radially inwardly from the outer periphery thereof, a disc-shaped section extending transversely of the axis of said casing and having the diameter of its outer peripheral edge conforming to the diameter of the interior of said casing and being located between and spaced in the axial direction of said casing from said first end and said second end, a first spring section disposed in contact with and located between said disc-shaped member and said first end and a second spring section disposed in contact with and located between said disc-shaped member and said second end, said first spring section and said first end located at one side of said disc-shaped member are symmetrical to said second spring section and said second end located on the opposite side of said disc-shaped member, said recess in said charge engaging surface wholly located within said first end and said recess in said bullet engaging surface wholly located within said second end, the base of said recess in said charge engaging surface spaced inwardly in said first end from said charge and the base of said recess in said bullet engaging surface spaced inwardly from said bullet and said recesses being similarly shaped and symmetrical about said disc-shaped section, means for retaining said charge and said bullet within said casing, said first and second spring sections arranged in compression in the axial direction of said casing for pressing said charge and said bullet against said means for retaining them in said casing, said bullet having a centrally arranged recess in the end thereof in contact with the bullet engaging surface of the second end of said wad with the recess in the bullet engaging surface extending axially away from the end of said bullet in contact wth the second end of said wad so that when the charge is exploded said bullet engaging surface is driven forwardly into the recess in said bullet forming a tightly fitting connection with said bullet due to the resilient character of the wad whereby said wad remains secured for said bullet acting as tailwing thereof over the trajectory of said bullet unti it contacts a target.

4,043,268

CONTAINER CONSTRUCTION FOR AN EJECTABLE BALLISTIC PAYLOAD

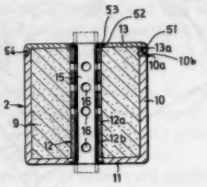
Siegmar Fischer, Dusseldorf-Kaiserswerth; Dietmar Karius, and Güenter Sikorski, both of Dusseldorf, all of Germany, assignors to Rheinmetall GmbH, Dusseldorf, Germany

Filed June 2, 1976, Ser. No. 691,975

Claims priority, application Germany, June 7, 1975, 2525553

Int. Cl.[2] F42B *13/14*

U.S. Cl. 102—66 **9 Claims**



1. In an ejectable payload for a ballistic projectile, the payload comprising incendiary material arranged along and coaxially around a central ignition channel of the projectile and disposed within a plurality of hollow annular elongated containers, the containers being successively disposed axially in abutting relation between a front nose portion and a rear tail portion of the projectile, the inner boundary of each container including at least one apertuer extending radially therethrough for providing communication between the interior of the ignition channel and the incendiary material within the associated container, an improved construction for the container which comprises, in combination, an axially extending outer cylindrical jacket, a first radially disposed end plate integral with and extending inwardly from a lower end of the outer jacket, the inner portion of the first end plate having a first recess in its outer surface, an axially extending inner cylindrical jacket having first and second flanges extending radially outwardly from its upper and lower ends, respectively, a second radially disposed end plate, the inner portion of the second end plate having a second recess in its outer surface, and means for removably and threadedly connecting the second end plate to the upper end of the outer jacket, the first and second flanges of the inner jacket being received tightly within the first and second recesses of the respective end plates when the second end plate and the outer jacket are threadedly connected.

4,043,269

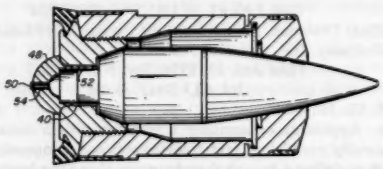
SEALED SABOT PROJECTILE

Leonard R. Ambrosini, Bettendorf, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 27, 1976, Ser. No. 691,048

Int. Cl.[2] F42B *13/34, 13/16*

U.S. Cl. 102—87 **4 Claims**



1. A sealed sabot projectile comprising:

a sabot having a cylindrical wall and a front face with an opening for insertion of the nose of a projectile therethrough,

a centering ring threadedly engageable with said wall and adapted to align and retain a projectile within said sabot, said ring having an opening therein to permit propulsion gases to impinge against said projectile in the separation thereof from said sabot, and

a seal within said opening having an orifice therein for controlled flow of propulsion gases therethrough,

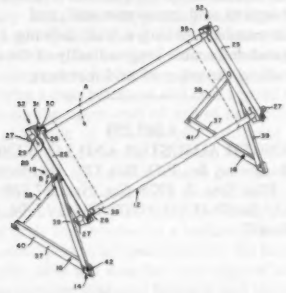
said seal including a semi-spherical cap overlying said ring opening and a long tubular protrusion fitting snugly within said opening, said orifice extending through said cap.

4,043,270

NEEDLEWORK FRAME

Antonia V. Miner, Londonderry, and Joseph Nichols, Newfane, both of Vt., assignors to Toni Totes of Vermont, Inc., South Londonderry, Vt.

Filed July 30, 1976, Ser. No. 710,159
Int. Cl.[2] D06C *3/08*
U.S. Cl. 38—102.91 **9 Claims**



1. As assembly for supporting needlework comprising

a. a needlework frame comprising a pair of side rails and a pair of dowels extending between said side rails and parallel to and spaced from each other,

b. a lap stand for supporting said needlework frame so that it is in a convenient workable position for someone in a sitting position with legs outstretched, said lap stand including a pair of distinct support brackets, each support bracket including a base member and a pair of support members extending upwardly from said base member to define, with said base member, a triangularly shaped support bracket, said base member of each of said lap stand supports having a pair of elongated faces thereof, and each support member of each support bracket being attached to an opposite face of said base member from the other support member of the support bracket,

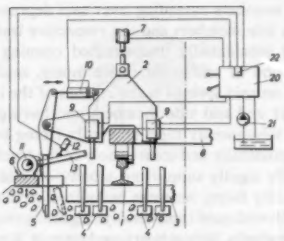
c. means for pivotally mounting said needlework frame on said lap stand so that said lap stand supports said needlework frame yet the needlework frame is pivotal with respect thereto, said means comprising a slot formed at the end of each support member of each of said lap stand support brackets, said slots having an overlapping area providing an opening when defining a triangularly shaped support bracket, a bolt attached to said needlework frame and passing through each said opening formed by said slots in each of said support brackets, and a wingnut in operative association with each said bolt for releasably holding said support brackets to said needlework frame when tightened onto each of said bolts.

4,043,271

MOBILE TRACK TAMPING MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H., Vienna, Austria

Filed Jan. 19, 1976, Ser. No. 650,022
Claims priority, application Austria, Feb. 27, 1975, 1536/75
Int. Cl.[2] E01B *27/16*
U.S. Cl. 104—12 **9 Claims**



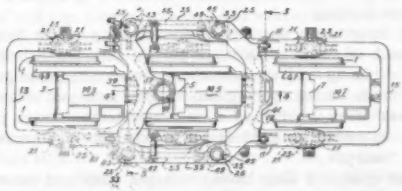
1. In a mobile track tamping machine for compacting ballast supporting a track consisting of rails mounted on ties having two elongated edges extending transversely of the rails and two ends extending in the direction of the rails, the elongated tie edges of adjacent ones of the ties defining cribs therebetween, which comprises a frame; a tamping tool assembly vertically movably mounted on the frame for tamping a respective one of the ties, the tamping tool assembly including a pair of opposed vibratory tamping tools arranged for immersion in the cribs adjacent one tie and for reciprocation in the direction of the rails, with the one tie positioned between the opposed tools, and an additional non-vibratory tamping tool arranged for immersion in the ballast adjacent an end of the one tie and for reciprocation in a direction transversely of the rails; and a vibratory surface tamper for tamping the ballast adjacent the tie end: the improvement of associating the additional non-vibratory tamping tool and the vibratory surface tamper with each other in closely adjacent relationship next to the tie end, the vibratory tamping force of the surface tamper reaching at least to the reciprocatory path of the additional nonvibratory tamping tool.

4,043,272

RAILWAY LOCOMOTIVE TRUCKS

William Clifford Jones, Jr., and Robert E. Long, both of Granite City, Ill., assignors to General Steel Industries, Inc., St. Louis, Mo.

Filed Oct. 15, 1975, Ser. No. 622,777
Int. Cl.[2] B61C *3/00*; B61F *3/06, 5/06, 5/16*
U.S. Cl. 105—136 **11 Claims**



1. In a railway truck, three wheeled axles including a first end axle, a middle axle and a second end axle, a truck frame resiliently supported on said axles and having longitudinally extending side members outboard of said wheels with portions elevated over said axles and depressed portions therebetween, first and second transverse transom members connecting said frame side member depressed portions intermediate said mid-

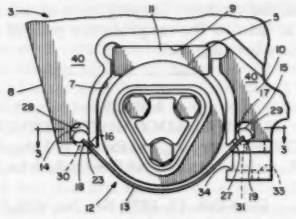
dle axle and the respective end axles, individual traction motors drivingly connected to said axles and having a reaction connection to said truck frame, a pair of outboard upright springs carried on each side member of said truck frame and spaced apart longitudinally thereof, the corresponding springs of each pair being aligned with each other transversely of the truck, a body-support bolster comprising transversely spaced apart longitudinally extending side members transversely outboard of said frame side members and longitudinally spaced apart end members extending over said depressed portions of said frame side members and the respective transom members defining a substantially unobstructed opening receiving the upper portion of said middle axle motor, said bolster being supported on said springs in the regions of the intersections of said bolster end and side members and having at least three vertically substantially rigid upwardly facing bearings spaced apart longitudinally and transversely of the truck for vertically substantially rigidly supporting a body on said bolster, all of said upwardly facing bearings being in alignment transversely of the truck with said transversely aligned springs, at least two of said upwardly facing bearings being in the region of the intersections between one of said bolster end members and said bolster side members, means forming a longitudinal force transmitting connection between said bolster and said frame at a level below said axle centers, and a vertical axis swivel bearing on the other bolster end member.

4,043,273

ALTERNATIVELY USABLE SLING AND KEY ROLLER BEARING RETAINERS

Franklin P. Adler, Michigan City, Ind., assignor to Pullman Transport Leasing Company, Chicago, Ill.

Filed Nov. 13, 1975, Ser. No. 631,756
Int. Cl.² B61F *5/26, 5/52, 15/2, 15/20*
U.S. Cl. 105—221 R **5 Claims**



1. In pedestal type side frame for a railway truck including an inner and outer depending legs spaced lengthwise of the frame forming,

a downwardly opening jaw for receiving an axle bearing,

each of said legs having a portion including a ledge and defining a enlarged chamber delineated by the ledge and a reduced slot opening into said jaw from said chamber,

said inner leg having a transverse bottom ledge portion spaced below said ledge of said chamber and opening into said jaw,

an elongated sling having enlarged inner and outer ends, means anchoring said ends to said leg portions within the chambers therein, adapted to be secured to said bottom ledge portion for selectively retaining the bearing within said jaw,

said sling extending through said slots and across said jaw below the bearing, and

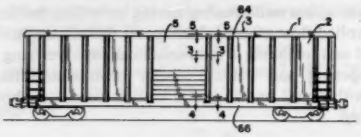
said inner leg having a passage being formed between said ledges adapted to receive a bearing retaining key.

4,043,274

RAILWAY CAR NAILABLE DOOR POST

Richard C. Snyder, Michigan City, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Aug. 27, 1975, Ser. No. 608,318
Int. Cl.² B61D *17/08, 45/00;* **E04B** *1/20, 1/32*
U.S. Cl. 105—409 **9 Claims**



1. In a freight car, a vertically extending nailable metal and wood door post for a door opening in the car side wall comprising:

inner and outer vertical metal post members,

means securing said members to the side wall, one of said members having a first transverse wall remote from the door opening,

a wooden nailing strip tightly interposed between said members and seated against said wall and spaced laterally away from the door opening,

means on one of said members for holding said strip within the post against said transverse wall, and

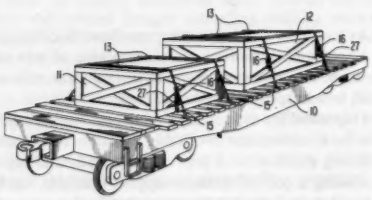
one of said members having a wall defining a side of said opening and deflectible longitudinally of the side wall and slidable along the other of said members.

4,043,275

CHAIN LENGTH ADJUSTER AND LOCKING DEVICE

William L. Rochester, Jr., P.O. Box 127, Aberdeen, N.C. 28315

Filed Dec. 3, 1975, Ser. No. 637,128
Int. Cl.² B61D *45/00, 49/00;* **F16G** *15/04, 15/14*
U.S. Cl. 105—477 **9 Claims**



1. A cargo lashing means comprising a length of link chain adapted to have one end anchored near one side of a cargo transporting base and adapted to have its other end releasably attached near the other side of the base by a conventional securing and tightening means, and a length adjusting and locking means for said chain allowing a slack loop of any necessary length to be formed in the chain between its ends and to be positively secured, said length adjusting and locking means comprising a pair of plate elements each having a slot formed therein extending inwardly from one marginal edge thereof and having an end terminating in the plate element, and fastener means releasably securing said plate elements in overlapping relationship with the slots of the plate elements in lateral registry the width of each slot being sufficient only to freely receive a respective link of said chain when inserted transversely into each slot, the presence of the adjacent links causing the links received in said slots to be immobilized against movement out of a respective slot in any direction when said plate elements are secured in said overlapping relationship.

4,043,276
SORTING TABLE ARRANGEMENT

Robert M. Dahl, 633 Park Ave., Wilmette, Ill. 60091

Filed Nov. 17, 1976, Ser. No. 742,594
Int. Cl.[2] A47B *11/00*
U.S. Cl. 108—28 10 Claims

1. In a sorting table arrangement, a substantially circular table top member, a substantially quadrilateral table top member, a unitary table base supporting said circular table top member and said quardrilateral table top member in cooperation with each other for use by a seated person on one side of said table arrangement for sorting paper-like items, said table base comprising a base platform and two spaced apart upright posts, means on the upper end of one of said posts secured to the center underside of said circular table top member for rotatively carrying said circular table top member in a horizontal plane above the lap of said seated person, means on the upper end of the other of said posts secured to the underside of said quadrilateral table top member for fixedly carrying said quadrilateral table top member in a horizontal plane above the lap of said seated person ad spaced below the horizontal plane of said circular table top member, one edge of said quadrilateral table top member disposed beneath said circular table top member on a chord of the circle of said circular table top member, a second edge of said quadrilateral table top member disposed opposite to and substantially parallel to said first edge, a third edge of said quadrilateral table top member on said one side of said table arrangement and extending substantially between one end of each of said first and second edges and disposed substantially along a line parallel to a radius of said circle of said circular table top member, a fourth edge of said quadrilateral table top member extending substantially between the other end of each of said first and second edges, a plurality of paper sorting dividers pivotally secured at one end of each thereof to the upper side of said circular table top member, and said dividers being disposed in a partially overlapping relationship in a ring disposed concentrically to and radially inwardly of the edge of said circular table top member.

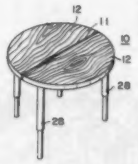
4,043,277
FOLDABLE STOOL

Doralee A. Wallace, Hollis, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 12, 1976, Ser. No. 676,313
Int. Cl.[2] A47B *3/00*
U.S. Cl. 108—35 2 Claims

1. A foldable stool formed with a platform of two panel members hinged together, with a plurality of telescopic legs hinged to the underside of the panels, the underside of said panels each fitted with spacer blocks along the outer edges of the panels for concealing the folded legs when the panels are folded together, with each telescopic leg formed of an inner member slidably mounted in a hollow outer member, said outer member formed with a through longitudinal slot extending for a portion of the length of said member in which slot rides the head of a key that is pivotally fixed to the said inner member,

said slot formed with an enlarged section of a size to accommodate the head of the key in a first position of rotation of said key, with the remainder of the slot of lesser width so as to block movement of the key in said first position, and



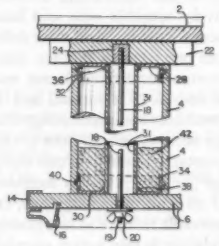
in the enlarged section of the slot, from travelling in said remainder of the slot, so as to latch the attached inner and outer members together when the key head is rotated to said first position in said enlarged section of the slot,

said key mounted in said inner section so as to project into the enlarged section of the slot of the outer section in the extended position of the legs.

4,043,278
KNOCK-DOWN LIGHT WEIGHT TABLE KIT

Milton Kessler, Youngstown, and Myron E. Ullman, Jr., Canfield, both of Ohio, assignors to Kessler Products, Inc., Youngstown, Ohio

Filed May 12, 1976, Ser. No. 685,803
Int. Cl.[2] A47B *13/02*
U.S. Cl. 108—150 12 Claims

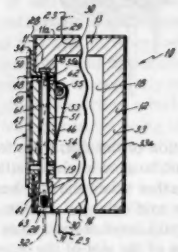


1. In a knock-down kit of light weight table components including a top, a base, a supporting column, trim and a tie rod for quick assembly without tools, in combination the improvement comprising: a centrally located blind hole in the underside of said top; fastener means in said hole to secure an end of said tie rod therein; said supporting column including an outer hollow columnar member, an inner hollow columnar member within said outer columnar member, a pair of end plates adapted to concentrically position said columnar members, means to concentrically secure said end plates between said columnar members, ballast means between said columnar members adjacent their lower ends, and means to secure said ballast means adjacent said lower ends; a hole centrally located in said base; said trim being adapted to snap on the periphery of said base and to extend beneath the underside thereof; the length of said tie rod being sufficient to extend through said hole in said base, and said inner columnar member with one end projecting into said blind hole in the underside of said top to be secured by said fastener means therein; and means to fasten the outer end of said tie rod adjacent the underside of said base, said trim extension providing clearance for said means to fasten the said other end of said tie rod.

4,043,279
SECURITY BOX

James M. Padgett, 1065 Reading Road, Mason, Ohio 45040

Filed Dec. 3, 1975, Ser. No. 637,376
Int. Cl.[2] E05G 1/04
U.S. Cl. 109—50 14 Claims



1. A security box adapted to be mounted in a building wall, said box comprising

a box housing including an access opening in the front face of said housing, said housing defining two bores therein, each of said bores communicating with said access opening, and one of said bores being threaded,

a door selectively operable with said housing to open and close said access opening, said door defining a bore therethrough from one edge to another, one of said housing's two bores communicating with one end of said through bore when said door is closed, and the other of said housing's two bores communicating with the other end of said through bore when said door is closed,

a hinge arm pivotally mounted at one end to said housing on a fixed hinge line, and pivotally mounted at the other end to said door on a movable hinge line, said movable hinge line being movable relative to said housing when said door is opened relative to said access opening, said hinge lines being substantially parallel one to the other, and said fixed hinge line being located adjacent the bottom edge of said access opening, and said movable hinge line being located adjacent the top edge of said door, the location of said hinge lines causing said door to drop beneath said access opening when said door is opened, and

a lock device selectively engageable with said housing and said door to lock same in the closed attitude, said lock device including

an elongated rod extending through said door's through bore and into said two housing bores when said door is in locked relation with said housing, said elongated rod being positioned substantially normal to said door hinge lines when said door is closed and locked,

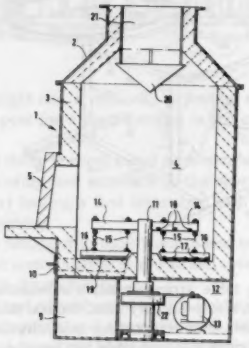
threads on one end of said elongated rod, said elongated rod being threadedly received in said threaded bore when said door is in locked relation with said housing, and

a lock cylinder fixed to the other end of said elongated rod, said lock cylinder's lug being selectively operable to prevent rotation of said rod when said door is in locked relation with said housing, thereby preventing disengagement of said rod from said threaded bore after locking relation has been established.

4,043,280
INCINERATOR

Stanley William Wray, Poole, and Michael George Warwick, Guildford, both of England, assignors to Hamworthy Engineering Limited, Poole and P.D. Pollution Control Limited, Rickfords Hill Aylesbury, both of England

Filed Feb. 12, 1976, Ser. No. 657,392
Claims priority, application United Kingdom, Feb. 18, 1975, 6788/75
Int. Cl.[2] F23G 7/00; F23B 1/16
U.S. Cl. 110—7 R 9 Claims

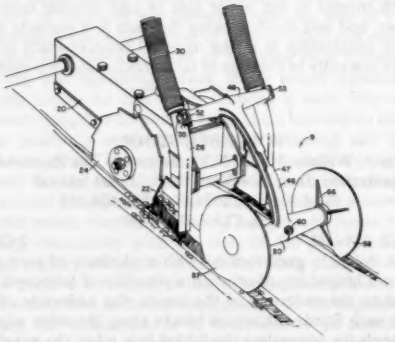


1. A waste incinerator, comprising a combustion chamber having a floor, at least one generally horizontal metal distributor bar adjacent to the floor, at least one support member spaced above the floor, non-rigid suspension means suspending at least one said distributor bar from an associated said support member, reversible driving means for moving the support member or members above the said floor to cause the distributor bar or bars to sweep at least part of the floor area, and a loading aperture for solid waste, at least one said non-rigidly suspended bar having a toothed edge and, opposite the toothed edge, a further edge forming a continuous blade.

4,043,281
DUAL PACKER WHEEL UNIT FOR TILLAGE APPARATUS

Donald Thomas Sorlie, Ankeny, and David Hoffer Bucher, Des Moines, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jan. 15, 1976, Ser. No. 649,280
Int. Cl.[2] A01C 5/04
U.S. Cl. 111—85 8 Claims



1. In a tillage unit having a pair of transversely spaced and driven cutter wheels capable of engaging and cutting a pair of

spaced furrows and a pair of transversely spaced seed delivery tubes for discharging seed in the respective furrows, the improvement residing in a dual packer wheel assembly, comprising:

bracket means including an arcuate leg connected at opposite ends to the central portion of a pair of substantially equal length arms, one of which is connected at opposite ends to spaced pivot points on the respective tubes and the other of which is a packer wheel mounting arm; and

a pair of packer wheels mounted for free rotation at the opposite ends of said packer wheel mounting arm, whereby said wheels are spaced apart a distance sufficient to follow and be received in the spaced furrows cut by said tillage unit, said wheels being narrower than the respective furrows so that each rides on the bottom of the furrow.

4,043,282

TAPE EDGE CLOSING MACHINE

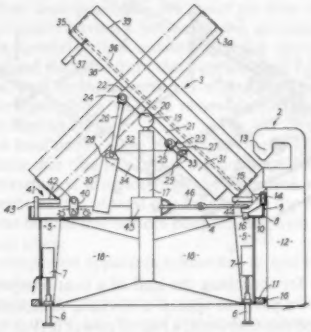
Peter Frederick Walter Fanghanel, Baldock, England, assignor to P. Fanghanel & Company Limited, Great Britain

Filed Mar. 30, 1976, Ser. No. 671,870

Claims priority, application United Kingdom, Apr. 1, 1975, 13222/75

Int. Cl.[2] D05B *11/00*

U.S. Cl. 112—3 R **8 Claims**



1. A mattress tape edge closing machine comprising a mattress support disposed at an acute angle to the horizontal, said support having an edge region, a sewing head arranged to sew in or near the vertical mode and means for causing each part of said edge region of said support to be brought successively into register with said sewing head.

4,043,283

SEWING APPARATUS EMPLOYING TWIN NEEDLES

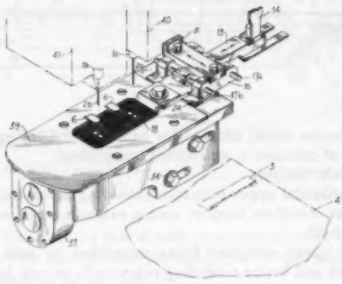
Wilhelm H. Jung, Mechanicsville, Va., assignor to AMF Incorporated, White Plains, N.Y.

Continuation-in-part of Ser. No. 596,324, July 17, 1975, abandoned. This application Dec. 13, 1976, Ser. No. 750,037

Int. Cl.[2] D05B *1/08*

U.S. Cl. 112—163 **6 Claims**

1. An apparatus for use in a sewing machine employed in the manufacture of two simultaneous tacks formed by joining a first unit of material to a second unit of material, after both have been fed into a sewing station including: a sewing machine head; said sewing machine head being defined by first and second independently driven sewing needles spaced apart with respect to one another in a vertical plane, each of said needles depending from first and second supporting members, said needles being movable in concert with respect to one another and to first and second units of material in said sewing station; needle adjusting means adapted to longitudinally displace said first supporting member with respect to said second supporting member in accordance with a predefined needle-to-needle distance, material guide means supported about said pair of needles for positioning said first unit of material with respect to said second unit of material, prior to initiating the movement of said pair of spaced apart sewing needles; first and second bobbins having associated first and second shuttle means, being adapted to cooperatively act with said pair of spaced apart sewing needles to form a plurality of stitches for



joining said first and second units of material; material feed means disposed in proximity to said sewing machine, being defined by interconnecting members driven to control longitudinal and lateral movement of first and second units of material during movement of said needles; and drive means interconnecting each of said bobbins through shaft means, for operating said first and second bobbin shuttle means in synchronization the respect to the movement of said needles.

4,043,284

BLIND STITCH SEWING MACHINE

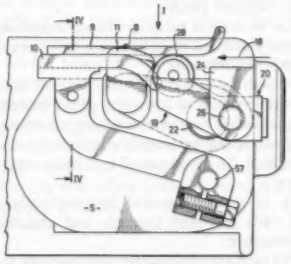
Winfried Rau, Turkenfeld, and Lothar Sommerschuh, Oberschleissheim, both of Germany, assignors to J. Strobel & Sohne GmbH & Co., Munich, Germany

Filed Feb. 17, 1976, Ser. No. 658,757

Claims priority, application Germany, Mar. 17, 1975, 2511568

Int. Cl.[2] D05B *1/24*

U.S. Cl. 112—178 **32 Claims**



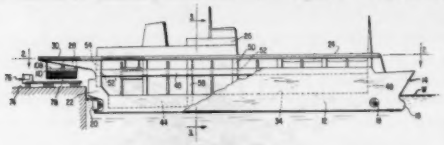
1. In a blind stitch sewing machine having a needle and a cloth carrying arm comprising a cloth bending means adjustable with respect to the needle, means for automatically adjusting the depth of penetration of the cloth by the needle by positioning the cloth bending means comprising a fabric feeler and a rod system through which the feeler cooperates with the cloth bender to set the highest position of the cloth bender.

4,043,285

CONTAINER SHIP

Immo R. Nordstrom, P.O. Box 305, Fair Haven, N.J. 07701

Filed Feb. 25, 1976, Ser. No. 661,140
Int. Cl.[2] B63B *25/22*
U.S. Cl. 114—72 **4 Claims**



1. A marine vessel adapted for handling and transport of a plurality of containers, said vessel comprising:

a. an external hull;

b. a horizontal upper structure extending across said hull;

c. upper structure support means extending rearwardly of said hull;

d. said upper structure being supported by said support means and hence extending rearwardly of said hull;

e. a cargo supporting deck disposed within said hull in substantial alignment with the waterline of said vessel;

f. an internal support framework comprising:

a pair of opposed longitudinal structural members extending longitudinally along the interior of said hull;

said longitudinal structural members being disposed below said upper structure and above said cargo supporting deck and in parallel relation to said deck;

a plurality of upright structural members extending along the interior of said hull at longitudinally spaced locations therealong, said upright structural members being interconnected with said longitudinal structural members; and

a plurality of transverse structural members extending transversely across the interior of said hull, said transverse structural members being substantially coplanar with said longitudinal structural members;

each of said transverse structural members being longitudinally aligned with an opposed pair of upright structural members and being interconnected with said longitudinal structural members;

g. means for internally dividing said vessel into a plurality of cargo compartments, said means comprising:

a plurality of vertical structural members extending upwardly from said cargo supporting deck; and

upper support means to which said vertical structural members are attached;

said upper support means being connected with said upper structure support means;

said vertical structural members being longitudinally and transversely aligned to define therebetween a plurality of cargo compartments;

h. container handling and transporting means comprising:

access opening means at the stern of the vessel;

said access opening means comprising an enlarged access opening extending between the underside of said upper structure and the rearmost of said transverse structural members;

a plurality of spaced parallel longitudinally extending support rails disposed beneath and attached to said upper structure;

said support rails extending from substantially the forward end of the cargo compartments, through said enlarged access opening and substantially to the rear end of said upper structure;

said longitudinal support rails forming at least two sets of crane rails arranged side-by-side and extending longitudinally above and across said cargo compartments;

a travelling bridge crane means supported upon and movable along each of said sets of crane rails;

said travelling bridge crane means comprising a first trolley means movable longitudinally through said vessel along said support rails and a second trolley means coupled with and movable transversely across said first trolley means;

said second trolley means including hoisting cables adapted for attachment to containers and controllable winding drums for raising and lowering said hoisting cables and containers attached thereto;

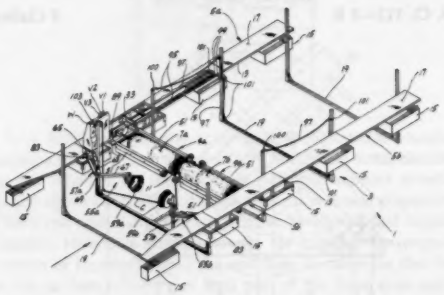
each of said travelling bridge crane means being adapted to transfer containers into and out of said cargo compartments by use of said first trolley means to accomplish longitudinal movement of said containers and by use of said second trolley means to accomplish transverse movement and raising and lowering of said containers.

4,043,286

BOAT HULL SCRUBBING APPARATUS

Frederick L. Doty, Rte. 47 West, P.O. Box 152, Monticello, Ill. 61856

Filed May 17, 1976, Ser. No. 687,193
Int. Cl.[2] B63B *59/00*
U.S. Cl. 114—222 **13 Claims**



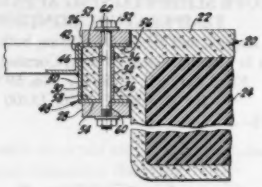
1. Apparatus for scrubbing the hull of a boat comprising a frame having two portions spaced a distance sufficient for a boat to be floated therebetween, a pair of power driven brushes extending generally transversely between said frame portions, means supporting each of said brushes for rotation about its longitudinal axis, means pivotally securing said supporting means together adjacent their inner ends for pivoting relative to one another about a substantially horizontal pivot axis extending generally perpendicular to the longitudinal axis of said brushes, means for mounting the outer end of each of said supporting means to its respective frame portion for vertical movement, for horizontal movement toward and away from its opposite frame portion, and for angular movement of each of said supporting means and its respective brush relative to its respective frame portion from a first position in which the brushes and the supporting means are generally horizontal for engagement of the brushes by the hull of a boat to be cleaned to a second position in which the brushes are angled downwardly from their said first positions and are disposed below the hull of the boat for scrubbingly engaging the latter with the pivotally connected inner ends of said supporting means being movable vertically downwardly and pivoting relative to one another and with the outer ends of the supporting means being movable vertically and angularly downwardly and horizontally inwardly relative to their respective frame portions as said brushes move from their said first positions to their said second positions to conform to the shape of the boat hull being cleaned, the position of the brushes being changeable to conform to the shape and depth of the boat hull and means for biasing the brushes upwardly toward their said first positions whereby the brushes are maintained in scrubbing engagement with the boat as the latter is floated over the brushes.

4,043,287

APPARATUS FOR CONNECTING FLOATING DOCKS

Myron L. Shorter, Jr., 81 Calypso Shores, Ignacio, Calif. 94947

Filed Jan. 29, 1976, Ser. No. 653,624
The portion of the term of this patent subsequent to July 6, 1993, has been disclaimed.
Int. Cl.[2] B63B *35/44*
U.S. Cl. 114—266 11 Claims



1. In a modular floating dock comprised of coupled individual float units each constructed with a substantially rectangular shell with opposed sidewalls and end walls, and top and a bottom, a means for connecting component apparatus to the modular floating dock comprising;

a. a flange structure projecting from one of the walls of the float units proximate the top of the float units, said flange structure having a horizontal top mounting surface and a horizontal bottom mounting surface displaced a predetermined distance from the top mounting surface;

b. at least one hole vertically extending through said flange structure from said top mounting surface to said bottom mounting surface;

c. at least one bracket element having a thin horizontal top plate and thin horizontal bottom plate displaced said predetermined distance from the top plate, said bracket element having at least one hole in said top plate and at least one hole in said bottom plate aligned with said hole in said top plate;

d. component apparatus connected to said bracket element, and;

e. interconnection means vertically extending through said hole in said top plate of said bracket elements, said hole in said flange structure, and said hole in said bottom plate when said bracket element is engaged on said flange structure for interconnecting said bracket element and said flange structure, said interconnection means including means for securing said bracket plates and said flange structure together in compression.

4,043,288

SHIP LOADING RAMP

Radoje Vulovic, Swarthmore, Pa., assignor to Sun Shipbuilding and Dry Dock Co., Chester, Pa.

Filed Oct. 23, 1975, Ser. No. 625,222
Int. Cl.[2] B63B *27/14*
U.S. Cl. 114—270 13 Claims

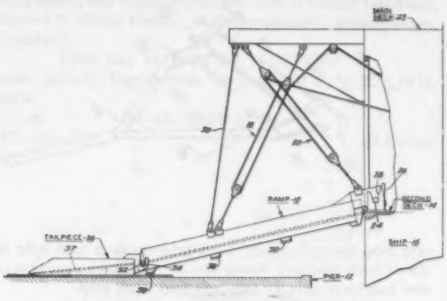
1. A ship loading ramp system designed to allow for a substantial change in tide by providing for automatic coupling and uncoupling to the ramp and comprising:

a. a ramp adapted to extend from a pier to the deck on a ship;

b. means for detachably coupling the ship end of said ramp to the ship such that the ramp may be vertically lifted out of the coupling means when the tide lowers the level of the ship's deck below the level of the pier, and the ramp may settle back into the coupling means when the tide raises the level of the ship's deck above the level of the pier;

c. means for supporting the ramp at a maximum positive angle as the tide raises the level of the ship above the level of the pier; and

d. means for detachably supporting the pier end of said ramp on the pier such that as the tide causes the level of the ship to rise, ship end of said ramp will be raised until the ramp reaches said maximum positive angle as defined by said ramp supporting means and the ramp will then proceed to be lifted off the pier at said maximum positive angle until the tide recedes and the ramp end of the ramp is again supported by the pier.

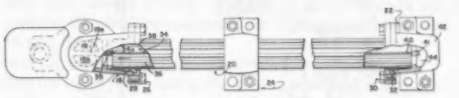


4,043,289

MARINE KEEL COOLER

Gustave Walter, Jersey City, N.J., assignor to The Walter Machine Company, Inc., Jersey City, N.J.

Filed Aug. 22, 1975, Ser. No. 606,784
Int. Cl.[2] B61D *27/00*
U.S. Cl. 115—75 3 Claims



1. For use with a vessel having a hull and equipped internally with an engine or similar accessory having a water circulating pump; a keel cooler comprising a header unit attached to the underside of the hull and communicated through the bottom of the hull with the pump, said header unit being vertically divided by a partition into two chambers providing outflow and inflow of water relative to the pump, a return fitting attached to the underside of the hull and spaced longitudinally from the header unit and at least one cooling tube connected between the header unit and the return fitting, said tube having a longitudinal flat divider plate extending centrally thereof for the entire length of the tube and dividing it into two equal and separate flow compartments for the flow of water of the same volume from the header unit to the return fitting and then back from the return fitting to the header, said tube being longitudinally fluted and being provided with a series of diametrically opposing internal grooves extending the full length thereof and separated and defined by internal radial projections extending the full length of the tube and said longitudinal divider plate having opposing side edges sealingly fitted in a pair of diametrically opposing grooves.

4,043,290

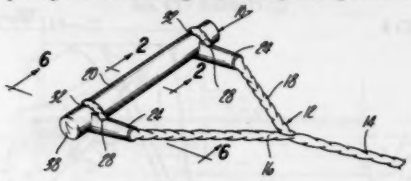
WATER SKI TOW HANDLE

Dennis P. Holland, 3599 Orchard Lake Road, Orchard Lake, Mich. 48033

Filed Oct. 18, 1976, Ser. No. 733,413
Int. Cl.[2] B63B *21/56*
U.S. Cl. 115—6.1 16 Claims

1. In a tow rope arrangement for water skiing which includes an elongated hand grip having friction material thereon and at least one hole extending transversely therethrough, a tow line threaded through said hole and terminating in a loop

firmly encircling said hand grip and a protective sleeve having an axial bore encompassing said tow line, the improvement comprising a hole extending transversely through said sleeve,



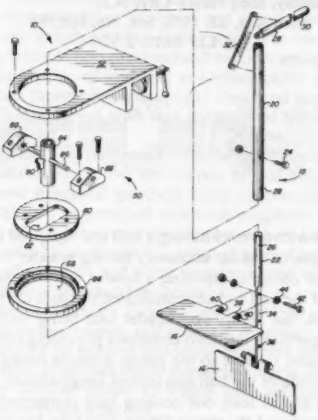
said loop encircling said hand grip through said hole in said sleeve such that said sleeve also encompasses a portion of said tow line loop directly adjacent said hand grip.

4,043,291

ROWING AND STEERING DEVICE FOR BOATS

Charles D. Bearup, Phoenix, Ariz., and Marvin F. Few, Socorro, N. Mex., assignors to Marvin F. Few, Socorro, N. Mex.

Filed Jan. 21, 1976, Ser. No. 651,134
Int. Cl.[2] B63H *1/32*
U.S. Cl. 115—29 **2 Claims**



1. A combination manual propulsion and steering device for a boat which comprises:

a. a bracket adapted to be attached to a boat, said bracket having a generally horizontal rearwardly extending flange, said flange defining an opening;

b. a collar secured to said flange, said collar defining an opening therein substantially concentric with the opening in said flange, an annular groove extending around said collar;

c. a bearing plate rotatively secured between said flange and said collar at said annular groove, said bearing plate having a slot therein;

d. a sleeve pivotally carried on a pivot shaft having an axis generally transverse of the axis of said sleeve, said pivot shaft mounted in bearing members on said bearing plate;

d. a vane shaft assembly longitudinally extending through said sleeve;

f. means for releasably securing said vane shaft assembly relative to said sleeve;

g. a vane carried on the lower end of said vane shaft assembly pivotal relative to said vane shaft assembly between a motive and a non-motive position; and

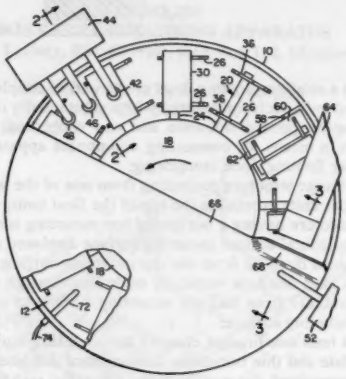
h. arm means located at the upper end of said vane shaft assembly for actuating the vane shaft whereby a boatman can propel said boat by manually reciprocating said arm means and whereby said boat can be steered by rotation of said vane shaft assembly and said bearing plate to position said vane relative to the boat to generate a force component in the desired direction.

4,043,292

MICROSCOPE SLIDE STAINING APPARATUS HAVING TEMPERATURE CONTROL

Charles H. Rogers, and Kevin J. Sullivan, both of Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.

Filed July 21, 1975, Ser. No. 597,442
Int. Cl.[2] B05C *5/00, 15/00*
U.S. Cl. 118—5 **13 Claims**



1. An apparatus for staining biological specimen-containing microscope slides comprising

microscope slide support means having means for conveying a plurality of slides along a predetermined path,

means disposed along said predetermined path for introducing a metered amount of at least one staining reagent on only that surface of said slide on which said specimen is disposed to form a reagent film,

means disposed along said path for maintaining the temperature of said reagent film within a given range of temperature for a given period of time, and

means disposed along said path for removing said reagent film from said slides at the expiration of said given period of time.

4,043,293

DEVELOPABILITY REGULATING APPARATUS

Frederick R. Ruckdeschel, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 3, 1976, Ser. No. 682,230
Int. Cl.[2] G03G *15/08*
U.S. Cl. 118—7 **16 Claims**

1. An apparatus for regulating the developability of a development system employing particles, including:

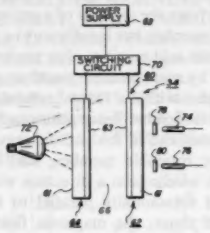
transparent electrode means electrically biased to attract particles thereto,

means for illuminating said electrode means having particles deposited thereon with light rays;

first means, having a peak transmittance corresponding to the peak transmittance of the particles, for detecting the intensity of the light rays transmitted through the particles adhering to said electrode means and generating a first electrical signal indicative thereof; and

second means, having a peak transmittance corresponding to

the peak absorbence of the particles, for detecting the intensity of the light rays transmitted through the particles



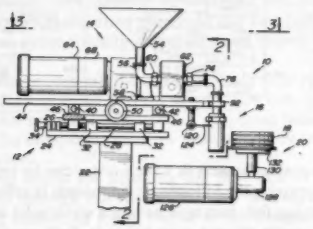
adhering to said electrode means and generating a second electrical signal indicative thereof.

4,043,294

CAKE ICING APPARATUS

Richard L. Morine, and James J. Hokes, both of Euclid, Ohio, assignors to Fedco Inc., Mentor, Ohio

Filed Feb. 3, 1976, Ser. No. 654,871
Int. Cl.² B05C *5/02*
U.S. Cl. 118—9 **7 Claims**



1. Apparatus for applying icing to the sides of cylindrical cakes comprising:

a. a rotatable support means for supporting a cylindrical cake in a generally horizontal position with the axis of the cake extending vertically;

b. power means for selectively rotating said support means to cause a cake positioned thereon to be rotated about said axis;

c. icing discharge nozzle means positioned closely adjacent said support means by means which permit selective adjustment of said nozzle means relative to said support means and including a closed chamber having a vertically-elongated discharge slot means and valve means operable to open and close said slot means;

d. a source of icing;

e. variable-speed, positive displacement pump means connected between said source of icing and said chamber for supplying icing to said chamber under a comparatively-lower pressure; and,

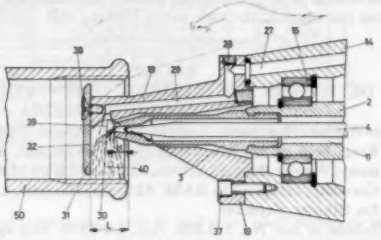
f. control means including a timer for energizing said pump means and opening said valve means for a period of time substantially equal to one revolution of said support means and thereafter substantially simultaneously stopping said pump means closing said valve means.

4,043,295

APPARATUS FOR SPRAY-COATING INTERNAL SURFACES OF TUBULAR ARTICLES

Reinhold Speck, and Stefan Forberger, both of Singen, Germany, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed July 14, 1975, Ser. No. 595,500
Claims priority, application Switzerland, July 22, 1974, 10050/74
Int. Cl.² B05B *13/06*
U.S. Cl. 118—317 **3 Claims**



1. Apparatus for applying a coating material to the internal threads of a fitting or tube end to a predetermined axial depth, comprising:

a fixed nozzle (3) arranged for directing a jet of coating material along the axis of said internal threads;

a revolving air jet nozzle (19) having its discharge orifice (30) radially offset and in front of the discharge orifice of said fixed nozzle (3) and arranged to revolve while remaining directed approxiamately at right angles to the axis of said fixed nozzle;

means for supplying air to said revolvig nozzle (19);

means for supplying coating material to said fixed nozzle (3), and

a spray cone limiting plate (31) mounted on the rotating end of the apparatus adjacent to said revolving air jet nozzle (19),

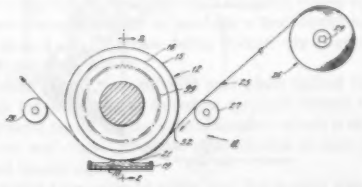
whereby a spray cone of said coating material is projected onto said internal threads, so that the coating thickness increases with axial distance from the open end of the threads to a maximum thickness axial location and the coating is caused to be thicker at the inner end than at the outer end due to the limiting of the spray cone by said plate (31).

4,043,296

ROLL CONSTRUCTION FOR COATING APPARATUS

Simon Long Chu, Dobbs Ferry, N.Y.; Peter Shu, Fogelsville, Pa., and Robert Sharowsky, Hastings-on-Hudson, N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Mar. 15, 1976, Ser. No. 666,859
Int. Cl.² B05C *3/12*
U.S. Cl. 118—419 **5 Claims**



1. Apparatus for applying a controlled film of coating material on a relatively non-porous web moving lengthwise; said apparatus including a backing roll including a central portion engaged with one surface of the web, and means in the vicinity

of said backing roll for applying coating material in liquid form to the other surface of the web by providing a meniscus supported solely by surface tension; said backing roll also including stepped-down portions at each end of said central portion; said central portion being substantially narrower than the web; the radius of said stepped-down portion being less than the radius of the central portion by a step height which is greater than deflection of the web which is the radial distance between those edges of the web that overlie the stepped-down portions of the backing roll and the web section engaged with the central portion; said edges of the web being far enough from said central portion to prevent coating material from migrating from the edges of the web to the backing roll.

4,043,297

DEVICE FOR THE MAGNETIC ORIENTATION OF MAGNETIC RECORDING MEDIA

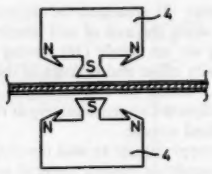
Job-Werner Hartmann, Ludwigshafen; Roland Falk; Aribert Krug, both of Achern; Georg Huber, Willstaett, all of Germany; Werner Balz, Stoneham, Mass., and Karl Mahler, Kehl, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 523,826, Nov. 14, 1974. This application Oct. 12, 1976, Ser. No. 731,140

Claims priority, application Germany, Nov. 17, 1973, 2357517

Int. Cl.[2] B05C *11/00*

U.S. Cl. 118—640 **2 Claims**



1. An apparatus for the manufacture of magnetic recording media comprising flat rigid discs of a non-magnetic metal and a coating, applied to one or both sides thereof, wherein at least two pairs of magnetic poles are arranged symmetrically opposite one another, one pair of poles flaring out in cross section toward the plane of symmetry between the pairs of poles, whereas the other pair of pairs of poles of opposite polarity, when viewed in cross section, taper toward the said plane of symmetry to a point and are spaced further apart than the flared poles.

4,043,298

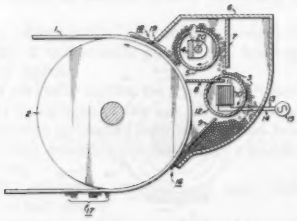
MAGNETIC TONER SCAVENGING SYSTEM

Stanley B. Swackhamer, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 26, 1976, Ser. No. 690,211

Int. Cl.[2] G03G *13/08*

U.S. Cl. 118—652 **3 Claims**



1. A magnetic toner recovery apparatus, comprising:

a. a non-alternating polarity magnetic field producing magnet within a first rotatable member, said magnet and rotatable member positioned relative to a magnetizable recording medium travel path so that the magnetic field of said magnet is of sufficient strength to magnetically attract airborne toner from the vicinity of a recording medium to said rotatable member but insufficient to prevent gravity fall of toner from said member after predetermined movement of toner by said rotatable member; and

b. an electromagnet within a second rotatable member, said second rotatable member being positioned below said first rotatable member and in the path of gravity fall of toner from said first rotatable member; said electromagnetic provided with windings in a direction which produces a magnetic field substantially parallel to the direction of gravity fall of toner; the magnetic field alternating in magnetic polarity.

4,043,299

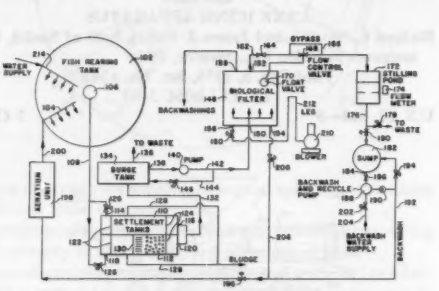
FISH REARING SYSTEM

Alexander E. Birkbeck, Delta, and Craig C. Walden, Vancouver, both of Canada, assignors to British Columbia Research Council, Vancouver, Canada

Filed May 1, 1975, Ser. No. 573,548

Int. Cl.[2] A01K *63/00*

U.S. Cl. 119—3 **12 Claims**



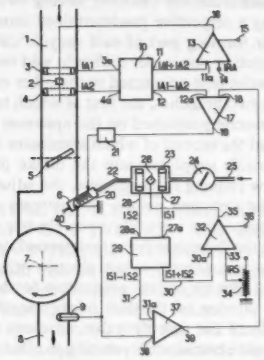
1. A fish rearing system in which water can be recycled, the system comprising the following components in combination: a tank containing fish, said tank having a water inlet and a water outlet, the outlet of said tank being in fluid communication with the inlet of a first gravitational separator tank means for the removal of large suspended debris with low retention time for the water in the separator tank means, said separator tank means having a sludge outlet, weir means spaced from said separator tank inlet means and located in an upper portion of the separator tank adjacent an outlet means for said separator tank, a second particulate media filter tank with its inlet connected to the outlet of said first separator tank and containing filter media particles in the size range of 0.5 to 10 mm. whereby biological water purification sites are provided on such particulate media, outlet means in said particulate media tank, water backwash means whereby backwash water can be forced through the particulate medium of the filter to clean the medium when required, air scour means whereby air can be forced through the particulate medium to lift and expand the medium and agitate the mediumm vigorously to permit adequate backwashing of the medium by the backwash water, pump means to move water through the filter tank, aeration means positioned between the filter tank outlet and the recycled water inlet of the fish tank whereby water in the system can be aerated and stripped of carbon dioxide, conduit means whereby water can be fed from the fish tank outlet through the other components of the system to the fish tank inlet, and means for feeding fresh water into the system.

4,043,300

APPARATUS FOR BALANCING THE FLOW OF TWO AGENTS, CAPABLE OF REACTING TOGETHER TO PROVIDE ENERGY, TO AN ENERGY GENERATOR

Claude Lombard, Le Chesnay, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of France

Filed Feb. 4, 1975, Ser. No. 546,893
Claims priority, application France, Feb. 8, 1974, 74.04384
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EA 25 Claims



1. A device for controlling the ratio between the flow rates of two agents capable of reacting together to provide energy to means for generating energy by the interaction of said agents, the device comprising:

means providing respective ducts for the flow of said agents,

a differential type detector in each said duct comprising a central ion generating electrode and two collecting electrodes symmetrically disposed with respect to the ion source,

means for processing the signals of each flow rate detector,

means for supplying current to said flow rate detectors,

means for regulating the current supplying means,

means for comparing the flow rates sensed by said flow rate detectors.

adjusting means for adjusting the flow rate of one of said agents through the respective duct, said adjusting means being connected to the output of the comparing means,

temperature sensing means for sensing the temperature of at least one said agent, and

means connecting said temperature sensing means with said comparing means for varying said ratio according to the temperature sensed.

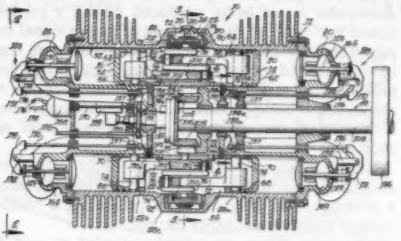
4,043,301

INTERNAL COMBUSTION ENGINE

Lawrence M. Rheingold, Baldwin, N.Y., assignor to Templet Industries Incorporated, Plainview, N.Y.

Continuation-in-part of Ser. No. 588,876, June 20, 1975, abandoned. This application May 24, 1976, Ser. No. 686,211
Int. Cl.[2] F02B *75/18*
U.S. Cl. 123—52 B 28 Claims

1. An internal combustion engine comprising, in combination, housing means defining a longitudinal axis, at least two axially aligned piston receiving chambers within said housing means, said piston receiving chambers having annular configurations and each chamber being substantially closed at one end and open at its opposite end such that the open ends of said chambers are in substantially axially opposed relation, an annular piston disposed within each of said piston receiving chambers means mounting said pistons for reciprocal and rotatable movement within said chambers, said pistons being rotatable about a common axis and each cooperating with its associated piston receiving chamber to define an annular combustion chamber, at least one connecting rod pivotally connected to each of said pistons and extending generally parallel to the axis of rotation of said pistons, drive shaft means supported by said housing means for rotation about an axis coincident with the common axis of said annular pistons, said drive shaft means extending outwardly of said housing means, means interconnecting said connecting rods to said drive shaft means so as to effect selective rotation of said drive shaft means upon reciprocating movement of said pistons, and means for introducing combustible fuel into said combustion chambers and effecting ignition of said fuel in a manner to effect reciprocating movement of said pistons.

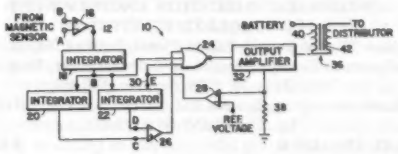


4,043,302

SOLID STATE IGNITION SYSTEM AND METHOD FOR LINEARLY REGULATING THE DWELL TIME THEREOF

Douglas Charles Sessions, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 607,402, Aug. 25, 1975. This application Dec. 19, 1975, Ser. No. 642,504
Int. Cl.[2] F02P *1/00*
U.S. Cl. 123—117 R 18 Claims



1. A solid state ignition system for an internal combustion engine, which ignition system is responsive to successively applied alternating timing signals generated in timed relationship with the engine to charge and discharge an ignition coil to produce spark to operate the engine, comprising in combination:

first circuit means for varying the phase of the timing signals applied thereto by a predetermined amount which is a function of the engine rotational speed;

second circuit means responsive to the applied timing signals for processing the same to produce a first output signal, said second circuit means being operatively coupled to said first circuit means;

third circuit means responsive to said phase shifted timing signals for producing at an output terminal thereof a second output signal having a time duration which is dependent on said degree of phase shift effected to said phase shifted timing signals;

gating means responsive to either said first output signal or said second output signal for producing a control signal at an output thereof;

amplifier switching means responsive to said control signal from said gating means for conducting direct current through the coil to charge the same;

said first and second circuit means being responsive to the next one of the applied timing signals such that said first and second output signals are inhibited for a predetermined time to render said amplifier switching means nonconducting to discharge the ignition coil; and

said second circuit means further including;

a. fourth circuit means adapted to receive each successive timing signal for producing a monopulse signal and a reference signal at respective outputs thereof, said monopulse signal being produced during a predetermined half cycle of each successive timing signal for a predetermined duration thereof, said reference signal having first and second portions, said first portion being indicative of said predetermined duration when said monopulse is being produced, said second portion being indicative of the remainder of the duration of each successive applied timing signals;

b. feedback means responsive to said direct current conducted through said amplifier switching means reaching a predetermined magnitude for producing a feedback control signal at an output thereof;

c. fifth circuit means operatively coupled to said first circuit means and said feedback means and being responsive to said monopulse signal and said feedback control signal for producing a variable threshold signal at an output thereof so that the excess dwell current through the coil is maintained a substantially fixed percentage of the time duration of the timing signals, the magnitude of said variable threshold signal being linearly related over a predetermined dynamic range to the time duration of each successive timing signal and the time duration for charging the ignition coil; and

d. comparator-gating means responsive to said reference and said variable threshold signals applied thereto for producing said first output signal when the magnitude of said second portion of said reference signal reaches a predetermined value with respect to the magnitude of said variable threshold signals.

4,043,303

AIR-FUEL RATIO CONTROL SYSTEM FOR INTERNAL-COMBUSTION ENGINES WITH CONTROLLED IGNITION

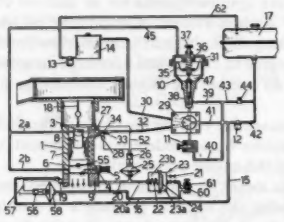
Mariano Migliaccio, and Emilio Pisani, both of Napoli, Italy, assignors to Consiglio Nazionale Delle Ricerche, Italy

Filed June 20, 1975, Ser. No. 588,811

Claims priority, application Italy, June 24, 1974, 51712/74

Int. Cl.[2] F02M *7/00, 13/00*

U.S. Cl. 123—119 R **8 Claims**



1. An air-fuel ratio control system operating in response to the running conditions of an internal-combustion engine, having an intake pipe, with controlled ignition and fed by a liquid fuel, continuously supplied through a main pump from a main fuel source and which liquid fuel, during operation, is at least partially deviated into a recycle circuit connected to the main fuel source and, as the throttle valve controlling the intake pipe is at least partially opened, is injected into the intake pipe into which the carburation air is drawn from the atmosphere under the control of a manually operable shut-off valve, said air-fuel ratio control system comprising in combination, a supply pipe supplying the fuel from said main fuel source through said main pump; a fluidistor having an inner chamber; at least three branch pipes branching from said supply pipe and communicating with said inner chamber; a first branch pipe supplying a jet of fuel at a constant delivery rate, a second branch pipe supplying a jet of fuel at a constant but adjustable delivery rate, and a third branch pipe supplying a jet of fuel at a variable delivery rate; a pressure sensitive diaphram valve controlling the delivery rate of said third branch pipe in response to the resultant value of the sub-atmospheric pressure in said intake pipe as sensed on the upstream and downstream sides of said throttle valve; said fluidistor chamber having two outlet orifices each having a respective predetermined cross-section; a recycle reservoir forming part of said recycle circuit; a first outlet pipe connecting one outlet orifice to said recycle reservoir; a second outlet pipe connected to the other outlet orifice and divided into two branches, the first of which terminates in a fuel injection nozzle positioned on the upstream side of said throttle valve and the second of which terminates in an adjustable injection nozzle supplying into the intake pipe the fuel required for slow running of the engine, the adjustable injection nozzle being arranged on the downstream side of said throttle valve; respective normally open electric valves controlling each of the branches from said second outlet pipe; a pressure transducer connected to said electric valves and operable to shut said electric valves responsive to the degree of vacuum in the interior of the fuel intake manifold, on the downstream side of the throttle valve, to close said electric valves, said pressure transducer operating to close said electric valves only when the degree of vacuum in the manifold is below a predetermined minimum value; and means operable to adjust said pressure sensitive diaphram valve and effective also during operation of the engine.

4,043,304

FUEL INJECTION SYSTEM FOR SELF-IGNITING INTERNAL COMBUSTION ENGINES

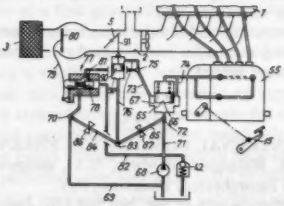
Gerhard Stumpp; Konrad Eckert, both of Stuttgart; Detlev Runge, Gerlingen, and Wolf Wessel, Schwieberdingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Apr. 30, 1974, Ser. No. 465,503

Claims priority, application Germany, May 2, 1973, 2321907; Mar. 1, 1974, 2409774

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **45 Claims**



1. In a fuel injection system for an internal combustion engine, including a suction tube through which air for engine combustion is drawn, an exhaust gas line through which engine exhaust gas flows, an exhaust gas recycle line, a control mechanism including a throttle flap member mounted in any one of said suction tub, exhaust gas line and recycle line extending between and being connected to the suction tube and the exhaust line to thereby establish a flow path for a recycled portion of the exhaust gas flow through the exhaust gas line to the suction tube, with the connection of the recycle line to the suction tube being downstream of the location of the throttle flap member in the suction tube, and with the connection of the recycle line to the exhaust gas line being upstream of the location of the throttle flap member in the exhaust gas line, said

throttle flap member controlling the pressure drop between the exhaust gas line and the suction tube for determining the flow rate of the recycled portion of the exhaust gas, fuel injection means, and regulating means for regulating the quantity of fuel injected by the fuel injection means, said regulating means including an air measuring member mounted within the suction tube and comparison means connected to the air measuring member and the fuel injection means, with the position of said throttle flap member in its respective tube or line defining a control parameter which is detected by the air measuring member and transmitted to the comparison means for adjusting the quantity of fuel injected by the fuel injection means.

4,043,305

CONTROL DEVICE FOR REGULATING THE COMPOSITIONS OF THE INLET AND EXHAUST GASES OF AN INTERNAL COMBUSTION ENGINE

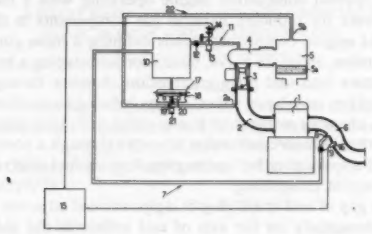
Claude Henault, Chevilly Larue, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of France

Filed Oct. 14, 1975, Ser. No. 621,770

Claims priority, application France, Oct. 25, 1974, 74.35834

Int. Cl.[2] F02B *33/00;* F02M *23/04*

U.S. Cl. 123—119 A **5 Claims**



1. A control device useful in an internal combustion engine having a carburetor, an engine inlet, and an exhaust outlet, for regulating the composition of the inlet gases and hence the exhaust gases,

said control device having first passage means bypassing said carburettor for supplying extra air to said engine inlet, a control valve in said first passage means, second passage means for recirculating exhaust gases to said engine inlet, an electrically operated valve in said second passage means, an exhaust gas composition sensor installed in said exhaust outlet of said engine for providing signals dependent on the composition of the engine exhaust gases, and a controller responsive to said signals from said exhaust gas composition sensor to control said electrically operated valve and thereby the flow of exhaust gases through said second passage means,

the improvement wherein said control device further comprises

a pressure-sensitive device communicating with said second passage means upstream of said electrically operated valve, and

means connecting said pressure-sensitive device to said control valve in said first passage means

whereby said control valve is operated to regulate the supply of extra air to said engine inlet in response to the pressure in said second passage means.

4,043,306

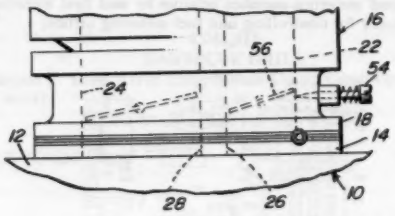
CARBURETOR SPACER PLATE WITH VAPOR FUEL INLET

William G. Abbott, P.O. Box 1103, Hanford, Calif. 93230

Continuation-in-part of Ser. No. 476,285, June 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 335,570, Feb. 26, 1973, abandoned. This application Sept. 16, 1975, Ser. No. 613,802

Int. Cl.[2] F02M *13/08;* F02B *77/00;* F02M *23/04*

U.S. Cl. 123—121 **8 Claims**



1. In combination with a carburetor body and an attendant intake manifold, said body and manifold including registered air and fuel induction passages formed therethrough, a spacer plate mounted between said body and manifold, said plate having an opening formed therethrough registered with said passages and an outer periphery extending about said opening, a supplemental fuel vapor induction tube having an inlet end portion and an outlet end portion, said tube being supported from said plate with said outlet end portion embedded in said plate and said inlet end portion projecting outwardly through one outer peripheral edge of said plate, said outlet end portion including a vapor outlet section thereof extending along one periepheral portion of said opening and provided with a lateral outlet opening transversely into said opening, said outlet end portion being closed at its end remote from said inlet end portion, a first of said air and fuel passages of said body including a pivoted throttle plate controlling the flow of air therethrough and including a free swinging edge portion swingable in an upstream direction in said first of said air and fuel passages upon said throttle plate being pivoted toward its open position, said outlet in said vapor outlet section of said tube opening into the portion of said opening formed through said plate corresponding to the portion of said first of said air and fuel passages in which said free swinging edge portion is received when said throttle plate is at least substantially closed, said body including an idle fuel outlet port opening into the last mentioned portion of said first of said air and fuel passages.

4,043,307

FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Masaaki Noguchi, Nagoya; Masaharu Sumiyoshi, Toyota; Taro Tanaka, Chiryu, and Hideya Fujisawa, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of Japan

Filed Feb. 13, 1975, Ser. No. 549,806

Claims priority, application Japan, June 24, 1974, 49-72076

Int. Cl.[2] F02M *39/00;* F02B *3/00*

U.S. Cl. 123—139 AW **7 Claims**

1. A fuel injection system for an internal combustion engine having a plurality of cylinders, an intake pipe, intake ports interconnecting said intake pipe and said cylinders, and intake valves disposed in said intake ports, said system comprising:

fuel metering means mounted on said intake pipe and operating in response to the operating conditions of said enging to meter the flow of fuel supplied to said engine, said fuel metering means including:

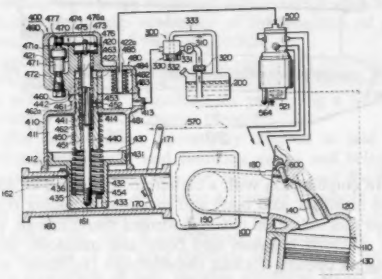
a suction piston mounted on said intake pipe and being axially movable in response to the variation in the flow of air passing through said intake pipe;

a first metering member connected to said suction piston for movement therewith;

a second metering member operatively associated with said first metering member to define therewith a fuel metering orifice;

a differential pressure regulator for maintaining constant the difference of the fuel pressure across said fuel metering orifice; and

a temperature compensation means engaged with said second metering member and operative in response to the variation of the temperature of the fuel to move said second metering member relative to said first metering member for controlling said fuel metering orifice;



a plurality of fuel injection nozzles each disposed in one of said intake ports for injecting the metered fuel into said intake port;

a fuel distributor means connected to said fuel metering means and said nozzles for distributing the metered fuel to each of said fuel injection nozzles so that the fuel is injected from each of said nozzles into an associated intake port for a period of time extending from the time before an associated intake valve is closed to the time after the same intake valve is closed; and

an advancer connected to said distributor means and operative in response to the increase in the rotational speed of said engine to advance the fuel distribution timing of said distributor.

4,043,308

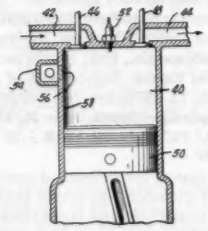
CONTROL OF THE INITIATION OF COMBUSTION AND CONTROL OF COMBUSTION

Anthony E. Cerkanowicz, Livingston, N.J., assignor to Photochem Industries, Inc., Fairfield, N.J.

Division of Ser. No. 468,543, May 9, 1974. This application Apr. 27, 1976, Ser. No. 680,867

Int. Cl.[2] F23H *5/20*

U.S. Cl. 123—143 R **4 Claims**



1. In a method of controlling the initiation of combustion and controlling combustion in a mixture that includes fuel and an oxidizer, the step comprising irradiating the mixture with ultraviolet energy sufficient to precondition the mixture by the photodissociative creation of a combustion intermediary species in a concentration below that required for the photochemical initiation of combustion at the temperature of the mixture but above the concentration of said species that would exist at the thermal ignition temperature of the mixture, in which said mixture is contained within the combustion chamber of an internal combustion engine.

4,043,309

INTERNAL COMBUSTION ENGINE HAVING AUXILIARY COMBUSTION CHAMBER

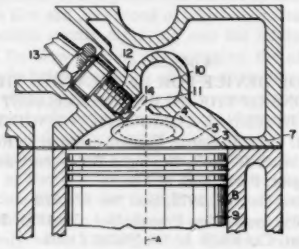
Takashi Kato; Koichi Hoshi, and Norihiko Nakamura, all of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sept. 4, 1974, Ser. No. 503,178

Claims priority, application Japan, Apr. 25, 1974, 49-45513[U]

Int. Cl.[2] F02B *23/00*

U.S. Cl. 123—191 SP **7 Claims**



1. In an internal combustion engine operating with a lean fuel-air mixture for reducing harmful gas components in the exhaust, said engine comprising means defining a main combustion chamber, an intake valve, means for introducing a lean air-fuel mixture into said main combustion chamber through said intake valve, an exhaust valve, means defining an auxiliary combustion chamber without an intake valve in fluid communication with said main combustion chamber through a nozzle therein, and a spark plug for igniting the lean air-fuel mixture, the improvement comprising:

the spark gap of said spark plug being positioned adjacent to and substantially on the axis of said nozzle in the main combustion chamber.

4,043,310

AUXILIARY APPARATUS FOR HOT-STARTING INTERNAL COMBUSTION ENGINE

Touru Ichimiya, and Koichi Oosawa, both of Shizuoka, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed June 11, 1975, Ser. No. 586,032

Claims priority, application Japan, Feb. 18, 1975, 50-20233

Int. Cl.[2] F02N *17/00*

U.S. Cl. 123—179 G **6 Claims**

1. An auxiliary apparatus for hot-starting an engine comprising:

an intake manifold, said manifold having an opening in one end thereof and being directly connected to an intake port opening into a cylinder at the other end thereof;

an intake pipe opening into said intake manifold, at an intermediate portion thereof between and spaced from said ends thereof;

a secondary air injection nozzle having one end extending through said opening in said one end of said manifold and terminating in the space between said intake pipe and said one end of said manifold whereby said nozzle will not interfere with intake flow from said intake pipe;

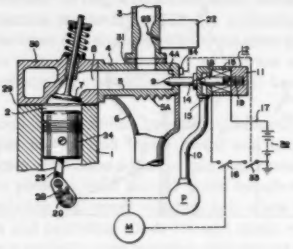
an air pump for supplying pressurized secondary air to said secondary air injection nozzle;

a secondary air supply conduit for fluidly communicating said air pump and said secondary air injection nozzle;

an electromagnetic valve comprising:

a body having an opening in one end thereof, the other end of said nozzle being in direct fluid communication with said opening in said body;

a valve means disposed between said secondary air supply conduit and said secondary air injection nozle for opening and closing fluid communication between said conduit and said nozzle through said opening in said body, and



a solenoid coil for actuating said valve means; and

means for operating said solenoid coil to actuate said valve means only when the temperature of the intake passage exceeds a predetermined level and only at the time of cranking the engine, said operating means comprising:

an input circuit for said solenoid coil,

a thermoswitch electrically connected to said input circuit, and

a starter motor switch electrically connected to said input circuit in series with the thermoswitch.

4,043,311

JIG SAW BLADE WITH COOLING CHANNEL

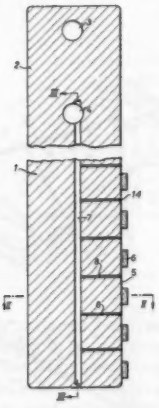
Hans Bieri, Toedistrasse 9, 8330 Pfaeffikon, Switzerland

Filed Oct. 20, 1975, Ser. No. 623,895

Claims priority, application Switzerland, Oct. 24, 1974, 14227/74

Int. Cl.² B28D *1/06*

U.S. Cl. 125—18 **11 Claims**



1. A cutting blade comprising an elongated blade shaft having a mounting end for mounting in a jig saw and a free end on the end thereof opposite said mounting end, said blade shaft having a pair of opposed longitudinally extending sides joined by at least one longitudinally extending edge, whereby said shaft has a neutral axis extending longitudinally in said blade with respect to bending loads, a channel exposed on only one side of said blade and extending substantially symmetrically along said neutral axis, cutting means comprising a plurality of longitudinally spaced apart cutting inserts secured to said one edge of said blade, a plurality of bores extending within said blade, said bores having outlet ports in said edge between pairs of adjacent inserts and extending to said channel, a cover sealingly inset in said one side of said blade and covering said channel, said channel being closed at the free end of said blade, and cooling medium supply means for directing a fluid into the end of said channel at said mounting end of said blade.

4,043,312

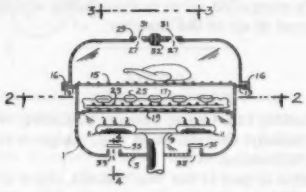
BARBECUE GRILL

Eugene F. Kern, 12115 Lake Meade Court, Creve Coeur, Mo. 63141

Filed Sept. 15, 1975, Ser. No. 613,571

Int. Cl.² A47J *37/00*

U.S. Cl. 126—41 R **8 Claims**



1. In a barbecue grill, a housing have an upwardly open fire box, a gas burner unit in said fire box, a grate for supporting meat mounted on said fire box above said burner unit, and a shield between said burner unit and said grate preventing cooking juices from dripping on said burner unit, said shield comprising a slab of refractory material reinforced with wire mesh and having lumps of refractory material permanently united with said slab and projecting upwardly from its top surface to simulate coals.

4,043,313

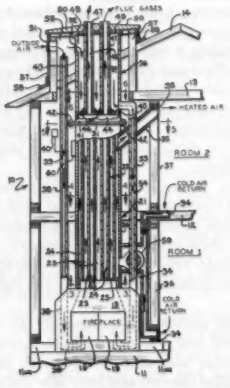
FIREPLACE CHIMNEY FURNACE

Larry P. Sherman, 430 East St., Muir, Mich. 48860

Filed Jan. 15, 1976, Ser. No. 649,401

Int. Cl.² F24B *7/04*

U.S. Cl. 126—121 **12 Claims**



1. In a building with a fireplace having a combustion cham-

ber, a front opening leading into a room and means for closing the opening and having a flue gas exit from the fireplace, the improvement as a replacement for a conventional fireplace chimney which comprises:

a. multiple heat exchanging tubes mounted above the flue gas exit of the fireplace such tht the flue gases vent upward through vertically oriented openings in the tubes, wherein the tubes extend substantially between at least the exit of the fireplace and a ceiling of a room of the building;

b. a housing surrounding, supporting and enclosing the tubes except for the openings with at least one conduit from a room of the building for cold air inlet into the housing and at least one conduit for hot air exit from the housing into at least one room of the building wherein the tubes and housing are in the form of a heat exchanger unit;

c. a chimney sealed in gaseous connection with the openings in the tubes and leading outside the building which provides an exit for the flue gases from the tubes of the heat exchanger; and

d. an air conduit leading from outside of the building to the bottom of the combustion chamber including a thermostatically controlled valve in the conduit which regulates the amount of air to the chamber.

4,043,314

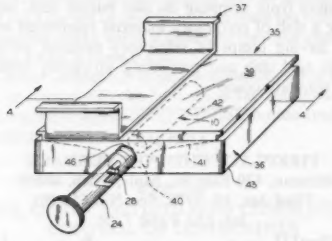
FOOD HEATERS

John H. Trumble, Elm Grove; Thomas C. Ehlert, Wauwatosa, and Akos Szekely, Colgate, all of Wis., assignors to Thermology, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 568,404, April 16, 1975, abandoned, which is a continuation-in-part of Ser. No. 545,206, Jan. 29, 1975, abandoned, and Ser. No. 562,352, March 26, 1975. This application Sept. 22, 1975, Ser. No. 615,518

Int. Cl.[2] F24J *1/02*

U.S. Cl. 126—263 **4 Claims**



1. A heating device comprising:

a thermo-conductive body having a heating surface, said surface having a pair of opposed parallel sides,

said body including a relatively thick elongate portion beneath said surface and oriented generally parallel to a first one of said pair of sides and substantially intermediate therebetween said body being generally thinner beneath said surface adjacent said first pairs of sides,

means defining an elongate cavity within said elongate portion of said body,

chemical heater means disposed within said cavity, said heater means comprises a cylindrical shell closed at a first end and closed at its second end by percussion ignition means, said shell containing a quantity of compressed alumino-thermic reactive material ignitable by the discharge of said ignition means, firing pin means for igniting said heater,

enclosure means enclosing substantially all but the heating surface of said body, said enclosure means comprising a generally planar wall disposed beneath said heating surface and parallel thereto and four side walls perpendicular to said planar wall, and

insulating means within said enclosure means and surrounding said body means beneath said heating surface for preventing substantial dissipation of heat from said body means other than through said heating surface.

4,043,315

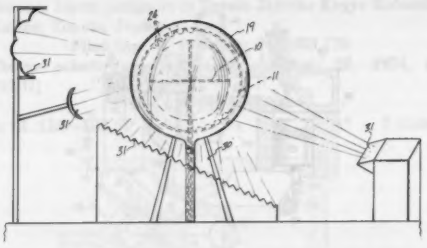
SOLAR HEAT COLLECTOR

Nathan E. Cooper, Brookside Drive, Woodbridge, Conn. 06525

Filed Feb. 3, 1976, Ser. No. 654,942

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—270 **5 Claims**



1. A solar heat collector comprising: a transparent, spherical outer shell; a spherical inner shell within said outer shell and spaced therefrom containing a plurality of light intensification means spaced along the periphery thereof; a plurality of heat collecting elements within said inner shell spaced from the light intensification means; and inlet and outlet headers communicating with said heat collecting elements and passing through said inner and outer shells for circulation of a heat transfer medium through said heat collecting elements, wherein said heat collecting elements comprise a circuitous array of passageways contained within a plurality of metal plates intersecting within said inner shell, said passageways being connected to a common inlet and outlet header.

4,043,316

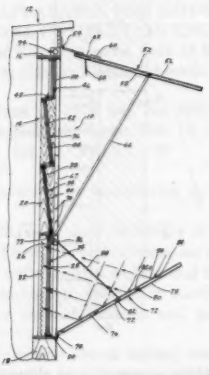
MODULAR DIRECT SOLAR HEAT WINDOW UNIT

Asa S. Arent, 700 - 15th St., North, Humboldt, Iowa 50548

Filed Mar. 5, 1976, Ser. No. 664,182

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—270 **13 Claims**



1. In combination,

a building,

a modular direct solar heat window unit mounted in the side of the building,

said window unit comprising a vertically disposed frame means having upper and lower ends and spaced-apart sides,

a lower window unit at the lower end of said frame means,

at least one upper window unit mounted in said frame means above said lower window unit for visibility,

a first panel member hingedly secured at its lower end about a horizontal axis to said frame means at the lower end thereof and being movable from a closed position adjacent said lower window unit to an open position, said first panel member having a reflective inner surface,

first connection means for adjustably positioning said first panel member in various positions relative to said lower window unit whereby the rays of the sun striking said inner surface may be reflected onto said lower window unit,

and a second panel member operatively hingedly secured to the upper end of said frame means and being movable from a closed position adjacent said upper window unit to an open position, said second panel member protecting and insulating said upper window unit when in its closed position and providing shade for said upper window unit when in a partially open position, said second panel member permitting normal visibility through said upper window unit when in its open position,

second connection means for adjustably positioning said second panel member in various positions relative to said upper window unit,

and a solar heat collector means positioned inwardly of said lower window unit.

4,043,317

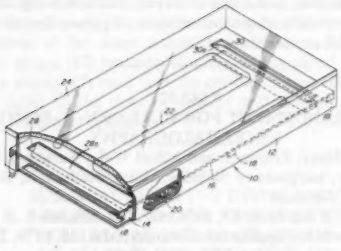
VENTED SOLAR COLLECTOR

Howard Scharfman, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed July 2, 1976, Ser. No. 702,179

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—270 **8 Claims**



1. A solar energy collector comprising a solar radiation absorbing panel adapted to be positioned to intercept solar radiation and to be heated by absorption of such radiation, a fluid conduit disposed in heat-conductive relation to the panel, a cover transparent to solar radiation mounted over the panel in spaced relation with it, and temperature-responsive means at each end of the panel for providing controlled circulation of air over the surface of the panel to maintain the temperature thereof below a prescribed level, said means including apertures adjacent each end of the panel, and adjustable portions of the panel movable into and out of closing relation to the apertures.

4,043,318

SOLAR ENERGY COLLECTOR

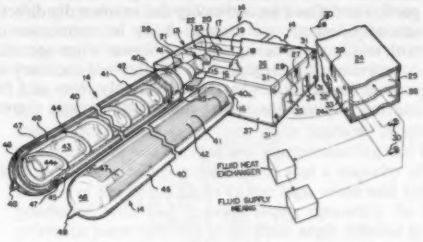
Yu K. Pei, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 482,092, June 24, 1974, Pat. No. 3,952,724. This application Jan. 26, 1976, Ser. No. 652,366

The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—271 **14 Claims**



1. A solar energy collector apparatus comprising an outer hollow, elongated tubular member of transparent glass, closed at its one end and open at its other end, a hollow, elongated tubular glass absorber member defining a glass wall of lesser O.D. than the I.D. of said outer member and closed at its one end and open at its other end, the absorber member having its exterior surface comprised of an energy absorbing coating applied thereon over a substantial portion of its axial length, said coating having high absorption and low emission properties, said absorber member being inserted within said outer member, resilient end support means engaging said closed end of the absorber member supporting it firmly in spaced relation to the interior surface of said outer member near the closed end of the latter and providing for expansion and contraction of the absorber member, an annular end portion of the glass at the open end of said absorber member being fused annularly onto the glass wall of the outer member, thereby sealing it to said outer member adjacent its other open end and closing an annular space therebetween, said space being evacuated, a heat exchange member communicating with the hollow interior of said absorber member, a fluid media supply means, and means connecting the supply means to the heat exchange member, whereby the fluid media absorbs the energy exchanged from the absorber member.

4,043,319

EXHAUST HOOD

Donald D. Jensen, 1141 Park Circle Drive, Fresno, Calif. 93727

Filed Sept. 18, 1975, Ser. No. 614,473

Int. Cl.[2] F24C *15/20*; F23J *11/00*

U.S. Cl. 126—299 D **5 Claims**

1. In combination with a hot cooking surface that has a forward and a rearward edge and from which surface fumes arise; a roof that is disposed above said cooking surface; first and second power-driven blowers mounted on said roof, each of said blowers including an air inlet opening and an air discharge opening; a stack that depends from said roof; a hood disposed above said cooking surface, said hood defined by a pair of side walls, a forwardly disposed portion, and rearward surface defining means, a fume control assembly, said fume control assembly including:

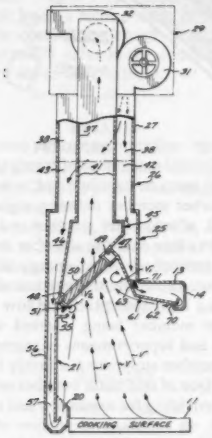
a. a duct longitudinally disposed in said stack and cooperating therewith to define a forward and rearward vertically extending cavity, said duct supported in a fixed position relative to said stack, said first and second cavities in communication with said discharge outlet of said first first blower, and said duct in communication with said air inlet opening of said second blower;

b. an air cleansing assembly operatively associated with said

duct, said air cleansing assembly removing grease from said fumes as the latter move upwardly therethrough;

c. a back wall that extends downwardly from said duct, said back wall cooperating with said rearward surface defining means to define a first vertical cavity in communication with said rearward cavity, and an upwardly directed elongate first opening longitudinally disposed relative to said rearward edge of said hot cooking surface and adjacent thereto; and

d. a downwardly and outwardly directed wall supported from said duct, said wall cooperating with said forward portion to define a second cavity and an inwardly directed second opening, said second cavity in communication with said forward cavity, said first blower when operating concurrently discharging air to said forward and rearward cavities for air to discharge concurrently from said first and second openings as first and second streams thereof,



said first stream discharging upwardly and forwardly of said back wall at a sufficient velocity as to create a negative pressure zone adjacent thereto to draw said fumes rearwardly and upwardly across said cooking surface to subsequently discharge through said air cleaning assembly, said second stream discharging rearwardly at an angle to said first stream to direct any fumes arising from said cooking surface not already moving upwardly and rearwardly in a rearwardly moving direction to mix with said first stream and subsequently flow through said air cleansing assembly, and said second blower when operating maintaining a negative air pressure in said duct above said air cleaning assembly to encourage the flow of said first and second streams mixed with said fumes through said air cleaning assembly to remove a substantial quantity of grease therefrom prior to the air in said duct being discharged through said air discharge outlet of said second blower.

4,043,320

HOOD ASSEMBLY FOR COOKING RANGES

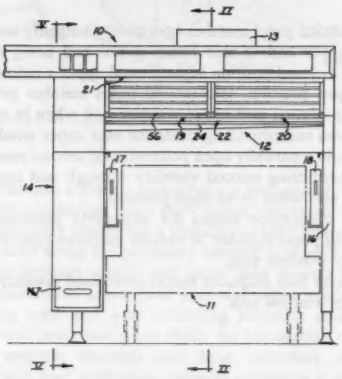
Mitchell Strew, Arlington Heights, Ill., assignor to Illinois Range Company, Mount Prospect, Ill.

Filed Mar. 26, 1976, Ser. No. 670,751

Int. Cl.[2] F23J *11/00*; B01D *47/06*

U.S. Cl. 126—299 E **15 Claims**

1. In a hood assembly for a range unit supported over a generally rectangular floor space and from which hot grease-containing vapors rise during operation thereof, a unitary structure adapted to be supported adjacent said floor space and comprising: a vapor treatment section for extending over a rearward portion of the range unit and including means defining a vapor treatment zone, spray means for spraying water into said zone, a supply pipe connected to said spray means and having an inlet end at one side of said vapor-treatment section in alignment with one side of said space, and trough means for receiving water sprayed into said treatment zone and having an outlet end at said one side of said vapor treatment section in alignment with said one side of said space, said unitary structure further comprising a water treatment section disposed along said one side of said space and including a generally rectangular housing having a front wall aligned with the front of said space, a pair of side walls with one being aligned with one side of said space and a top wall cover structure for approximate horizontal alignment with the upper surface of the range unit to provide a work surface adjacent thereto, tank means within said housing immediately below said top wall



cover structure and extending rearwardly from said front wall of said housing between said side walls thereof, first conduit means extending downwardly from said outlet end of said trough means to said tank means for gravity flow of grease-carrying water from said trough means down into said tank means for separation by flotation of lower density grease from higher density water, pump means having an inlet and an outlet, second conduit means coupling said pump means inlet to a lower point of said tank means below the level of grease therein, and third conduit means coupling said pump means outlet to said inlet end of said supply pipe for flow of water to said spray means, said top wall cover structure being movable for access to said tank means, removal of grease therefrom and cleaning and service thereof.

4,043,321

ARRANGEMENT FOR ULTRASONIC-ECHO ENCEPHALOGRAPHY

Richard Soldner, Erlangen, and Alfred Walz, Nurnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 17, 1975, Ser. No. 559,365

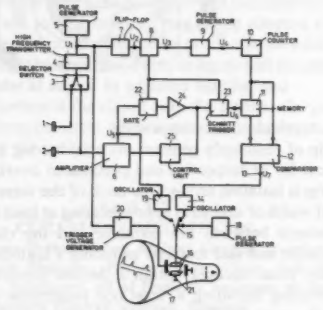
Claims priority, application Germany, Mar. 25, 1974, 2414218

Int. Cl.[2] A61B *10/00*

U.S. Cl. 128—2 V **12 Claims**

1. In an arrangement for the ultrasonic echo encephalography of a patient's skull, including at least two ultrasonic heads for providing the theoretical median echo, switching means **(3)** having a first switching condition providing for sounding operation between a first head **(1)** at one side of a patients skull and a second head **(2)** at the opposite side of the patients skull, and having a second switching condition providing for reflection operation, ultrasonic pulse means **(5, 4)** connected to the first head **(1)** in said first switching condition of said switching means **(3)** for energizing said first head **(1)** to transmit an ultrasonic pulse toward the second head **(2)**, receiving means **(6, 22, 24, 23)** coupled to the second head **(2)** in the first switching

condition for receiving the output of the second head (2) and for generating an output pulse (U_6) representing the timepoint of receipt by the second head (2) of the ultrasonic pulse from the first head (1), time measurement means (9, 10) comprising an impulse generator (9) having an output for supplying periodic pulses, and impulse counter means (10) having an input connected to the output of said impulse generator (9) and operable in both said first and second switching conditions for counting said periodic pulses, timing means (7, 8) coupled with said pulse means (5) and with said time measurement means (9, 10) and responsive to the energization of the first head (1) by said pulse means (5, 4) in said first switching condition to actuate said time measurement means (9, 10) so that the impulse counter means (10) counts the periodic pulses from the impulse generator (9), storage means (11) coupled with said counter means (10) and responsive to the output pulse (U_6) from said receiving means (6, 22, 24, 23) to store a count equal to the counting position of said counter means (10) at the



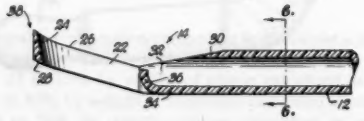
timepoint of receipt by the second head (2) of the ultrasonic pulse from the first head (1), a count condition comparator (12) connected to the counter means (10) and to storage means (11) and being operable in the second switching condition of the switching means (3) to periodically compare the count of said counter means (10) with the stored count of said storage means (11) so as to deliver an output signal (U_7) at the balance of both count conditions, display means (17) for receiving echo signals from one of the heads in the second switching condition, said timing means (7, 8) being operative to initiate counting of said counter means (10) in each cycle of energization of one of the head during reflection operation, and means (14, 15) operable in the second switching condition for periodically connecting the output of the count condition comparator (12) with the display means (17) for supplying a marking signal (U_7) to the display means (17) each time the counter means (10) reaches a count equal to the stored count of said storage means (11) during reflection operation.

4,043,322

SURGICAL SCRAPING INSTRUMENT

Ralph R. Robinson, P.O. Box 668, Middlesboro, Ky. 40965

Filed May 13, 1976, Ser. No. 686,015
Int. Cl.[2] A61B *1/00, 17/22;* A61M *1/00*
U.S. Cl. 128—2 B **2 Claims**



1. A surgical scraping instrument, comprising:

an elongated, tubular, substantially rectilinear suction tube having a material-receiving end, with the remaining end thereof adapted for connection to means for producing a negative pressure within said tube,

said material-receiving end being obliquely cut relative to the longitudinal axis of said tube and only partially across the diameter of the latter, for presenting an obliquely disposed planar surface having a generally elliptical, material-receiving opening therein at said material-receiving end, along with cooperable material-catching structure defined at least in part by the uncut portion of said tube adjacent and opposite to said opening, said material-catching structure also including an end wall portion at the extreme end of said uncut portion remote from said remaining end which extends towards said opening; and

a scraping element including a unitary loop of material presenting a pair of converging legs respectively connected to the material-receiving end of said tube on opposite sides of said opening and with said end wall portion therebetween, and an arcuate bight segment in spaced relationship to said opening and interconnecting said legs,

said spaced legs being oriented such that a majority of the lengths of the upper edges of the legs, when said tube is positioned with said opening facing upwardly, lie in a reference plane oriented at an acute angle relative to the longitudinal axis of said tube and at an obtuse angle relative to said planar surface, and with a portion of the edges of said legs being located at a first level above said opening,

at least the central portion of said bight segment remote from said opening being oriented such that the uppermost section thereof, when said tube is positioned with said opening facing upwardly, presents a protruding portion which lies at a second level above said reference plane and opening,

at least the edge of said bight segment contiguous with said leg edges being configured to present a scraping surface,

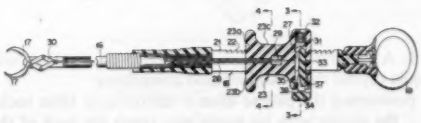
said scraping surface, opening and material-catching structure being cooperatively configured and oriented for catching material loosened by movement of said scraping surface along a uterine wall or the like.

4,043,323

MEDICAL INSTRUMENT ATTACHED TO AN ENDOSCOPE

Osamu Komiya, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1975, Ser. No. 643,861
Claims priority, application Japan, Dec. 27, 1974, 49-274
Int. Cl.[2] A61B *1/00*
U.S. Cl. 128—4 **6 Claims**



1. A medical instrument attached to an endoscope for insertion into a body cavity of a human being together with said endoscope, said instrument having a movable head attached to an elongate flexible tube; said movable head fitted to one end of said flexible tube; a base member disposed at the other end of the flexible tube and provided with a finger hook to be gripped by one of the fingers of an operator; an actuating wire inserted into the flexible tube so as to be slidable therethrough in the longitudinal direction and having its forward end operatively connected to the movable head, a slider fitted with the base end of the actuating wire, mounted on the base member so as to be slidable lengthwise of the base member, therby causing the sliding of said actuating wire and further provided with a finger-grip portion; and a manually operative locking mechanism for releasably locking the slider at a desired point on the

base member, the improvement being that the locking mechanism includes a toothed portion formed on one lateral edge of the base member in the longitudinal direction thereof; locking means received in a bore formed in the slider so as to be movable therein in a direction transverse to said longitudinal direction, said locking means having a knob portion extending outward from the bore of the slider and being designed to engage the toothed portion of the base member; and urging means supported on the slider so as to normally urge the locking means into engagement with the toothed portion of the base member, said locking means being disengaged from the toothed portion by depressing the knob portion against the action of said urging means; said locking means also being tiltable through an angle in a direction away from said transverse direction and having latch means for latching said locking means in a depressed position in which said locking means has been disengaged from the toothed portion of the base member when said locking means is tilted through said angle.

4,043,324

CHIROPRACTIC ANALYTIC TECHNIQUE WITH A LIQUID CRYSTAL SHEET

Alexander F. Shaw, IV, 329 E. 11th St., Davenport, Iowa

Filed Feb. 13, 1976, Ser. No. 657,914
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—2 H **7 Claims**

1. A method of chiropractic analysis of a patient using a liquid crystal sheet, said method comprising:

positioning the patient upon a chiropractic table such that the doctor with his hands may reach the back of the patient;

placing the liquid crystal sheet over the back of the patient;

detecting the temperature patterns of different areas of the back of the patient by ascertaining the color patterns displayed by the liquid crystal sheet thereby to determine areas of trauma;

palpating the back of the patient, the fingers of the doctor pressing through the liquid crystal sheet and against the body of the patient, thereby to determine areas of trauma; and

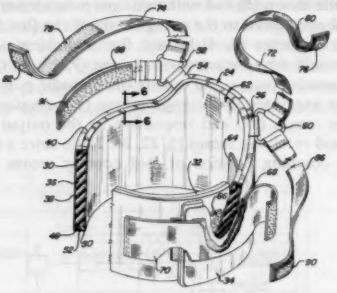
adjusting the patient, the hands of the doctor pressing through the liquid crystal sheet and against the back of the patient to administer a chiropractic adjustment, the chiropractic adjustment being selected to treat the determined areas of trauma.

4,043,325

CERVICAL COLLARS

David J. Ochs, 707 W. Magnolia; James D. Behrens, 4101 W. Lakeview Drive, and John H. Stevens, 3425 Arapahoe Drive, all of Fort Collins, Colo. 80521

Filed Sept. 13, 1976, Ser. No. 722,717
Int. Cl.[2] A61H *1/02*
U.S. Cl. 128—75 **26 Claims**



1. A cervical collar comprising:

a strip of resistantly-resilient material having a length sufficient for its respective end portions to overlap when said strip is installed around the neck of the wearer, the nominal width of said strip approximating at least the minimum distance between the mandible and the clavicle of the wearer, and said material including a high-density unicellular foam encased within a flexible covering with said covering including at least one lengthwise seam formed with mutually-facing in-turned marginal edge portions secured together beneath the exterior surface of said covering;

an intermediate lengthwise portion of said strip having an increased width, greater than the distance in normal posture between the underside of the chin and approximately the upper end of the sternum of the wearer, positionable beneath said chin;

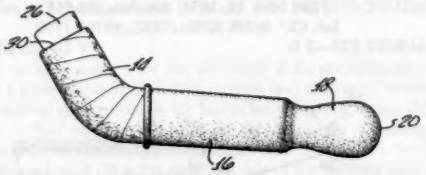
and means releasably fastening said end portions together in overlapping relationship with said strip disposed around the neck of said wearer and said increased-width portion positioned between said chin.

4,043,326

WATERPROOF CAST PROTECTOR

John D. Little, 25097 Champlain Road, Laguna Hills, Calif. 92653, and James Zeno Cloud, Jr., 25839 Marguerite Parkway, Apt. 103, Mission Viejo, Calif. 92675

Continuation of Ser. No. 530,959, Dec. 9, 1974, abandoned. This application Dec. 1, 1975, Ser. No. 636,508
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—82 **1 Claim**



1. A unitary, flexible covering to seal a cast on an individual's arm or leg and adapted to accommodate limbs and casts of a considerable range of lengths, comprising:

an elongate tube of resilient material for receiving said arm

or leg and said cast, said tube being closed at one end and open at the other end;

a considerable length of said elongate tube at said open end having a uniform, smooth inside relaxed diameter smaller than the diameter of that portion of said arm or leg over which said uniform diameter portion of said tube is adapted to extend, said uniform diameter portion forming a sealing portion of adjustable length;

a resilient, solid ring having greater thickness than said tube formed at the open end of said elongate tube, said ring forming a base structure for a roll of said uniform diameter portion and being adapted to be rolled along said arm or leg to a selected longitudinal position a substantial distance above the cast but below the end of the limb, the size and position of said roll depending upon the length of said limb and said cast;

said uniform diameter portion being of sufficient length that said roll is within the length of said uniform diameter portion for the entire range of limb and cast sizes on which it is adapted to be used, said ring being adapted to resiliently bias said uniform diameter portion at the location of said roll tightly against said arm or leg to seal the open end of said tube at any of its adjusted lengths; and

a bulbous portion at the closed end of a diameter larger than said uniform diameter portion to accommodate the hand or foot of the user.

4,043,327

CURABLE COMPOSITIONS

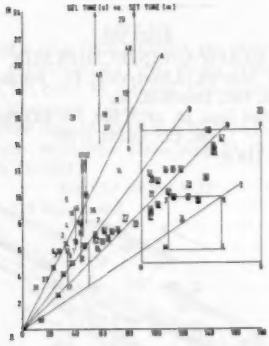
William Duncan Potter, Ware; Andrew Conway Barclay, Harlow; Reginald Dunning, Parbold near Wigan, and Richard John Parry, Southport, all of England, assignors to Smith & Nephew Research Limited, Harlow, England

Filed May 11, 1976, Ser. No. 685,487

Claims priority, application United Kingdom, May 13, 1975, 20196/75; May 13, 1975, 20197/75; Aug. 15, 1975, 34128/75

Int. Cl.[2] A61F *5/04*

U.S. Cl. 128—89 R **61 Claims**



1. A curable composition comprising in admixture a particulate calcium fluoroaluminosilicate glass consisting essentially of from 25 to 35% by weight of silicon calculated as silica, from 30 to 40% by weight of aluminum calculated as alumina, from 20 to 35% by weight calcium, calculated as calcium oxide, and up to 9% by weight fluorine; and a solid particulate polymer chosen from the group consisting of poly(carboxylic acid)s and polymeric precursors thereof; the whole mixture being in association with a porous flexible carrier material.

4,043,328

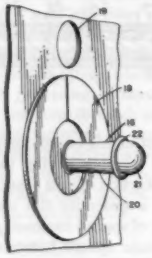
UROLOGICAL DRAPE

Charles D. Cawood, Jr., Houston, Tex., and John S. Ziegler, Arlington Heights, Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed June 1, 1976, Ser. No. 691,596

Int. Cl.[2] A61B *19/06*

U.S. Cl. 128—132 D **23 Claims**



1. A urological drape for use in transurethral resections and similar operations, comprising a sheet of flexible material having a generally centrally-disposed opening therethrough, and a finger cot of flexible stretchable material extending from said sheet about said opening, said cot having an elongated neck portion and terminating in an enlarged closed free end portion, said neck portion gradually increasing in diameter towards said enlarged end portion.

4,043,329

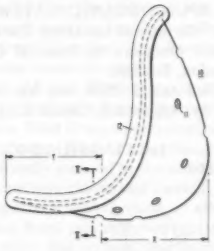
PROTECTIVE DEVICE

Frank J. DiMatteo, Monroeville, Pa., assignor to Caspel Industries, Bridgeville, Pa., a part interest

Filed June 16, 1976, Ser. No. 696,740

Int. Cl.[2] A61F *13/00*

U.S. Cl. 128—132 R **6 Claims**



1. A protective device comprising:

a rigid cup having sufficient volume to enclose the male genitals;

resilient padding mounted on the edge of said cup said resilient padding adapted to contact the body at the lower portion thereof and absorb impact experienced by said cup;

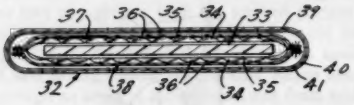
the resilient padding on the edge of said cup adapted to engage the body proximate to the superior ramii, the inferior ramii and the Ischial ramii of the pelvis with minimal contact with the upper thighs; and,

wherein when an impact is experienced by said cup it is absorbed by the padding and the aforementioned portions of the pelvis.

4,043,330
ARM BOARD FOR INTRAVENOUS INFUSIONS

Surinder K. Bansal, Apt. 6, 33 E. Lakeshore Drive, Cincinnati, Ohio 45237

Filed Feb. 18, 1976, Ser. No. 659,116
Int. Cl.[2] A61F 13/00
U.S. Cl. 128—133 5 Claims

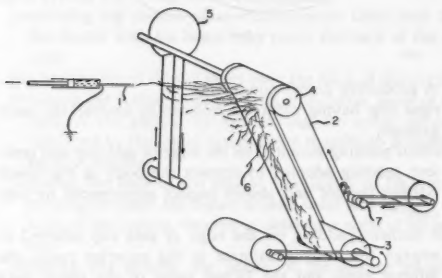


1. A medical restraining board comprising, in combination, a flat rigid support member having two opposed sides, means padding at least one side of said support member, said padding means including a generally flat sheet of resilient material having a plurality of spaced enclosed gas-filled pockets formed therein and wherein spaces between said pockets define a plurality of interconnected outwardly opening air-filled channels, a fluid pervious hydrophobic outer cover enclosing said support member and said padding, said outer cover being removable from said support member and padding, a microporous hydrophobic inner cover permanently enclosing said support member and padding, said inner cover being formed from a gas pervious and liquid impervious material, and moisture absorbing means positioned between said outer cover and said inner cover.

4,043,331
FIBRILLAR PRODUCT OF ELECTROSTATICALLY SPUN ORGANIC MATERIAL

Graham Ernest Martin, and Ian Derek Cockshott, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 1, 1975, Ser. No. 600,943
Claims priority, application United Kingdom, Aug. 5, 1974, 34338/74
Int. Cl.[2] A61L 15/00
U.S. Cl. 128—156 16 Claims

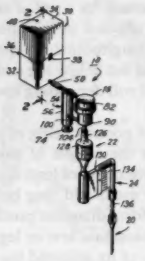


1. A product comprising a mat of organic fibers prepared by electrostatically spinning an organic material and collecting the spun fibers on a suitable receiver.

4,043,332
CONSTANT FLOW RATE LIQUID MEDICAMENT ADMINISTERING DEVICE

Harold J. Metcalf, Stony Brook, N.Y., assignor to Nathan Blumberg, Smithtown; Public Systems Research, Inc. and Harold J. Metcalf, both of Stony Brook, all of N.Y., part interest to each

Filed May 14, 1975, Ser. No. 577,294
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—214 E 6 Claims

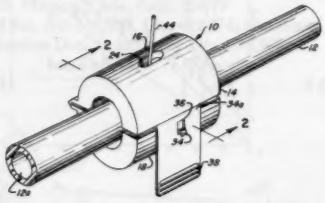


1. A constant flow rate liquid medicament administering device comprising:
   a. a container for a liquid medicament,
      i. said container having an outlet,
   b. means for pressurizing the liquid in the container,
   c. a constant flow rate throttling regulator having an inlet and an outlet,
   d. means connecting the container outlet to the regulator inlet;
   e. said regulator including means controlled as a function of the differential in the liquid pressures at the inlet and the outlet of the regulator and furnishing a throttled constant flow rate of liquid at the outlet of the regulator which is independent of the pressure of the liquid at the inlet and the outlet of the regulator,
   f. means for coupling the device to a patient, and
   g. means connecting the regulator outlet to the coupling means.

4,043,333
CLAMP-ON INJECTION SITE

John Michael Munsch, Libertyville, Ill., assignor to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Sept. 15, 1975, Ser. No. 613,709
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—214 R 17 Claims



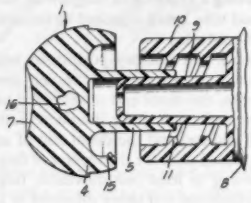
1. A self-clamping injection site adapted to be positioned along a flexible, needle-penetrable, tubular conduit, comprising:
   a. a sleeve member having a first section and a second section hinged together for moving each of said sections between an open position allowing the sleeve to be positioned along the tubular conduit and a closed position for fixing the sleeve on the conduit at a predetermined position;

b. said first and second sections defining securing mean for locking said sleeve at said predetermined position;
c. said sleeve further defining at least one needle receiving aperture for allowing a needle to readily pass therethrough;
d. said sleeve carrying a self-sealing, needle-penetrable material in said open and said closed position and in communication with said aperture; and
e. said material being compressed between said sleeve and said conduit by said securing means when said sleeve is in the closed position thereby permitting a needle to be injected through the aperture, the self-sealing material and the tubular conduit.

4,043,334
SELF RIGHTING SYRINGE PROTECTOR

Tony Ray Brown, Northridge, and Leonard Sarkis Neresian, Canoga Park, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed June 29, 1976, Ser. No. 700,901
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—215 **14 Claims**

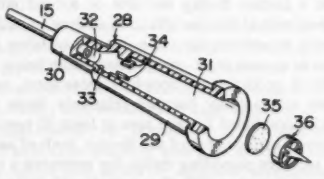


1. A self righting protector for a hypodermic syringe or the like comprising: a bulbous rocker having a base section; a connector joined to this rocker, said connector having an internally tapered section to wedgingly receive a tapered syringe tip or the like; and said rocker has a center of gravity adjacent its base section to orient the connector in an upward direction when the protector is on a flat horizontal surface, whereby a series of self righting protectors will be uniformly oriented.

4,043,335
NEEDLE HOLDER DEVICE OF MEDICAL ADMINISTRATING INJECTOR

Soji Ishikawa, No. 6-305-18, 1-chome, Utsukushiga-oka, Midori Yokohama, Kanagawa, Japan

Filed Aug. 13, 1976, Ser. No. 714,264
Claims priority, application Japan, Aug. 23, 1975, 50-116506; Mar. 11, 1976, 51-28087
Int. Cl.[2] A61M 5/32
U.S. Cl. 128—218 N **36 Claims**

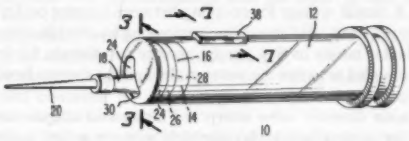


1. A needle holder device to form part of a medical administering liquid injector, comprising a generally tubular member formed with a longitudinal passageway extending between the opposite ends of the tubular member and consisting of a generally cylindrical first bore portion terminating at one end of the tubular member, a generally cylindrical second bore portion terminating at the other end of the tubular member and smaller in diameter than said first bore portion, the second bore portion being adapted to receive therein an end portion of an injection needle to be mounted on the holder device, and a generally frusto-conical third bore portion between the first and second bore portions and continuously reduced in diameter from its enlarged axial end adjacent the first bore portion toward its reduced axial end adjacent to the second bore portion, said first, second and third bore portions having respective center axes which are substantially in line with each other, and a filter assembly held in position within said first bore portion, said filter assembly including at least one filter element having its entire peripheral edge received on the inner peripheral surface of the tubular member and filter retaining means in contact with at least one end face of said filter element and formed with at least two open spaces providing communication between said first and third bore portions through said filter element, said filter retaining means including at least one generally tapered projection extending in a direction substantially parallel with the center axis of said first bore portion and passing through the center axis of said open spaces.

4,043,336
STERILE SYRINGE DEVICE

Robert J. Kreb, III, Rolling Hill Road, Skillman, N.J. 08558

Filed Apr. 21, 1976, Ser. No. 678,851
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—218 R **8 Claims**

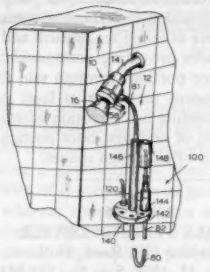


1. A sterile syringe device comprising:
a. a syringe housing of generally cylindrical shape including an opened and a closed end, said closed end defining a slot therein, said syringe housing defining a reservoir therein;
b. a plunger means positioned within said syringe housing and being slidably movable therein to vary the volume of said reservoir;
c. nipple means positioned protruding outwardly from said reservoir and extending through said slot means in said closed end of said syringe housing, said nipple means defining a flue therein to allow fluid flow communication outward from said reservoir; and
d. sealing means positioned in the interior of said syringe housing adjacent said closed end thereof to selectively prevent and allow fluid flow communication through said flue, said sealing means further comprising:
1. an inner seal fixedly secured to the interior walls of said housing adjacent said closed end thereof, said inner seal defining an aperture therethrough to allow fluid flow communication from said reservoir through said aperture of said inner seal to said flue within said nipple means; and
2. an outer seal rotatably mounted with respect to said syringe housing, said outer seal being positioned between said inner seal and said closed end within said syringe housing, said outer seal being fixedly secured to said nipple means to allow rotational movement of said outer seal responsive to movement of said nipple means within said slot means, said outer seal defining an opening therethrough, said flue of said nipple means and said opening being fixedly aligned with respect to one another and being selectively alignable with respect to said aperture responsive to movement of said nipple means within said slot means to allow fluid flow communication from said reservoir through said aperture and said opening to said flue.

4,043,337
DENTAL SYRINGE ATTACHMENT FOR SHOWER

Wilfred G. Baugher, 127 Yacht Haven Drive, Cocoa Beach, Fla. 32931

Filed July 12, 1976, Ser. No. 704,314
Int. Cl.[2] A61M *3/00*
U.S. Cl. 128—229 14 Claims



1. A dental syringe for coupling between a water outlet and a shower head, said apparatus comprising in combination:

adapter means having a main passageway therein for being coupled between the water outlet and the shower head for passing water therebetween;

a main diverter valve interposed along said adapter means for passing water therethrough when in a first position, and for diverting the water into a diverter passageway within said adapter means when said main diverter valve is in a second position, said main diverter valve having a first cylinder coaxially rotatable within a main valve cavity interposed along said main passageway, and said first cylinder having an axis of rotation generally parallel with but offset from said main passageway, with said first cylinder including therein a primary passageway for coupling the water under pressure therethrough when in said first position, and with said first cylinder further including a by-pass passageway therein for coupling the water under pressure from said main passageway to said diverter passageway when said first cylinder is in said second position;

conduit means having a first end coupled to said adaptor means to said diverter passageway for receiving water under pressure therefrom;

a manual syringe handle for coupling to a second end of said conduit means for passing water under pressure therefrom through a syringe passageway and an outlet port therein for forming a water jet; and

a secondary control valve interposed along said syringe passageway of said manual syringe handle for passing water therethrough when in a first position, for blocking the flow of water therethrough when in a second position, and for variably restricting the flow of water therethrough between said first and second positions, said secondary control valve having a second cylinder coaxially rotatable within a second valve cavity interposed along said syringe passageway, with said second cylinder having an axis of rotation generally parallel with but offset from said syringe passageway, said second cylinder including therein a control passageway for coupling with said syringe passageway when said second cylinder is in said first position, whereby said second cylinder blocks the flow of water therethrough when rotated into said second position.

4,043,338
PHARMACEUTICAL FORMULATION APPLICATOR DEVICE

Roger Homm, Neshanic, and Gilbert Katz, Boonton, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation of Ser. No. 355,366, April 30, 1973, abandoned. This application Aug. 19, 1976, Ser. No. 715,791
Int. Cl.[2] A61M *31/00*
U.S. Cl. 128—260 1 Claim

1. A device for dispensing a pharmaceutical formulation into body cavities which comprises:

a tube having a plurality of lengthwise, elongated ribs at one end, said tube being disposed to incorporate said formulation on said ribs;

a cylindrical rod slidably positioned within said tube and connected to said tube at the end containing said elongated ribs, the distal end of said tube being essentially flat is shape and comprising thumb actuating means, the free end of said rod and the distal end of said tube containing two opposed slots for the receipt of finger actuating means comprising at least one moveable finger support means, said cylindrical rod being disposed in pressure responsive relation to said tube such that pressure applied between the thumb actuating means and said finger acutating means causes the elongated ribs to distend, thereby depositing the pharmaceutical formulation on the interior walls of the cavity.

4,043,339
METHOD OF AND VAGINAL INSERT FOR PROSTAGLANDIN ADMINISTRATION

Theodore J. Roseman, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 2, 1976, Ser. No. 654,486
Int. Cl.[2] A61M *7/00*; A61J *13/08, 27/00*; A61M *31/00*
U.S. Cl. 128—260 73 Claims

1. A vaginal device adapted for insertion and placement in the female human vaginal cavity and subsequent removal therefrom, for the administration of an abortifacient or oxytocic prostaglandin to the epithelial tissues of said cavity, said device consisting essentially of a flexible resilient non-toxic polysiloxane elastomer substantially uniformly impregnated except at the elastomer surface with at least an effective amount of said absortifacient prostaglandin to accomplish an abortion in a human during the first or second trimester or pregnancy or with at least an effective amount of said oxytocic prostaglandin to accomplish the induction of labor in a pregnant human at or near term, said prostaglandin being present in free acid form or in a more lipophilic ester form, said device having two substantially parallel relatively large elastomer surfaces with combined surface area at least 70 percent of the total elastomer surface area of the device, both of said parallel elastomer surfaces providing means for assuming a contour to be in substantial contact with the vaginal epithelial tissue, there being substantially no prostaglandin at said parallel elastomer surfaces of said device prior to vaginal insertion, the combination of the total elastomer surface area of said device and the concentration of prostaglandin in said device constituting a means for providing a medically acceptable release rate of said prostaglandin in the human vagina to accomplish said abortion of said induction of labor, and the combination of the resilience

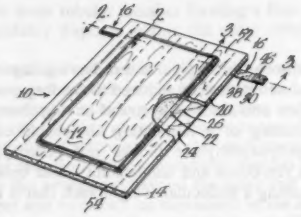
of said elastomer and the distance between said parallel elastomer surfaces being such that both of said parallel elastomer surfaces remain either in contact with said epithelial tissues or exposed to the fluids in said vaginal cavity when said device is in the vaginal cavity.

4,043,340

DIAPER WITH REPOSITIONABLE TAB FASTENER

Talivaldis Cepuritis, Kenilworth, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Feb. 27, 1976, Ser. No. 661,918
Int. Cl.[2] A41B *13/02*
U.S. Cl. 128—287 **9 Claims**



1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-impervious backing sheet substantially coextensive with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and an adhesive tab fastener means which comprises:

a first tape segment having an inner face and an outer face and including a fixed end secured to the diaper, and a free end which includes a midportion of said first tape segment adjacent to said fixed end;

a transferable tape segment adhesively carried on the inner face of one portion of the free end and provided with an adhesive coating on opposing faces thereof, one adhesive-coated face being adhesively but releasably attached to said inner face of said one portion of the free end, and the other adhesive-coated face being adapted for adhesive attachment to said diaper; and

release means permanently attached to said first tape segment along the remaining portion of said free end;

said free end being folded over to releasably attach said release means to the other of said opposed faces of said transferable tape segment and to substantially envelop said transferable tape segment between said midportion and said remaining portion of the free end of said first tape segment;

the adhesive attachment of said one face of said transferable tape segment to said free working end having a relatively higher peel strength than the attachment of said other adhesive-coated face to said release means to enable said free end and said transferable tape segment to be moved from the folded-over position to a working position in which said free working end is adapted to secure said diaper about said infant by adhesive attachment to said diaper outside surface via said transferable tape segment;

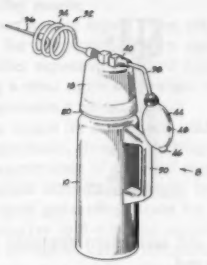
the adhesive attachment of said transferable tape segment to said diaper having a relatively higher peel strength than the adhesive attachment of said transferable tape segment to said free working end to enable said free working end to be detachable from and refastenable to said transferable tape segment for repositioning said diaper about said infant.

4,043,341

PORTABLE CRYOSURGICAL INSTRUMENT

Theodore A. Tromovitch, 1667 Escalante Way, Burlingame, Calif. 94010

Filed Dec. 9, 1975, Ser. No. 639,081
Int. Cl.[2] A61B *17/36*; B65D *47/34*
U.S. Cl. 128—303.1 **2 Claims**



1. A portable cryosurgical instrument suitable for one handed operation comprising:

an insulated container for holding a liquefied gas coolant;

closure means for said insulated container;

a pressure line communicating with the inside of said insulated container;

tubing means extending from near the bottom of said insulated container to the outside thereof;

heat exchange means attached to said tubing means outside said container for vaporizing said liquefied gas coolant passing therethrough;

application means attached to said heat exchange means for applying the vaporized gas coolant;

handle means on said insulated container;

a manual squeeze bulb connected to said pressure line and positioned adjacent said handle means in such position that when the fingers of a human hand grasp the handle, the thumb of the same hand is in a position to compress the bulb against the handle;

said squeeze bulb being connected to atmosphere through an opening in an intermediate portion of the bulb such that said opening must be covered before pressurization, wherein when said handle is gripped by the fingers of one hand of the operator, the bulb opening can be covered by the thumb of the same hand of the operator to stop venting before pressurization whereby the thumb compresses said bulb against said handle to cause pressurization.

4,043,342

ELECTROSURGICAL DEVICES HAVING SESQUIPOLAR ELECTRODE STRUCTURES INCORPORATED THEREIN

Charles F. Morrison, Jr., Boulder, Colo., assignor to Valleylab, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 501,224, Aug. 28, 1974, Pat. No. 3,987,795. This application Feb. 26, 1976, Ser. No. 661,555
Int. Cl.[2] A61B *17/32*; A61N *3/06*
U.S. Cl. 128—303.14 **2 Claims**

1. An electrosurgical device adapted for connection to an electrical generator having active and return output terminals, said device being used to cut, coagulate, or otherwise treat organic tissue or the like, said device comprising:

an insulative support means;

an active electrode having a distal end and being responsive to said active output terminal and a return electrode having a distal end and being responsive to said return output terminal, said electrodes being supported by said electrode support means, means for maintaining a fixed spacing between the active electrode and the return electrode, said return electrode being electrically insulated from and symmetrically disposed completely about said active elec-

trode, said active electrode extending at least as far as the distal end of said return electrode, both said electrodes being adapted for electrical connection to said tissue, the ratio of the return electrode area adapted to electrically connect to said tissue to the active electrode area adapted to electrically connect to said tissue being in the range of approximately 2 to 200;

means for connecting said active electrode to said active

output terminal and said return electrode to said return output terminal; and

means for so biasing said return electrode with respect to the active electrode that the return electrode is normally disposed at a first position where the return electrode extends as far as the distal end of the active electrode and a retracted position where the return electrode is retracted from the distal end of the active electrode in response to said active electrode being inserted into said tissue.

4,043,343

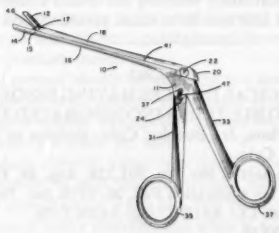
FORCEPS

Robert W. Williams, 3201 S. Maryland Parkway, Las Vegas, Nev. 89109

Filed Aug. 1, 1975, Ser. No. 601,060

Int. Cl.[2] A61B *17/28, 17/32*

U.S. Cl. 128—321 **3 Claims**



1. In forceps having a stationary first handle and first arm integrally secured thereto, a movable second handle pivotally secured on said stationary handle, and having a projecting member thereon received in an open recess along one side of a reciprocally moveable second arm, said second arm slidably mounted on said first arm, whereby pivotal movement of said second handle reciprocates said second arm, and whereby said second arm is disengageable by lateral movement away from said projecting member, the improvement comprising a stop member secured on said stationary handle for engaging the side of said second arm opposite said recess and preventing said lateral movement and disengagement thereof.

4,043,344

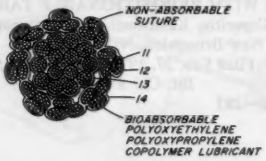
NON-ABSORBABLE SURGICAL SUTURES COATED WITH POLYOXYETHYLENE-POLYOXYPROPYLENE COPOLYMER LUBRICANT

Henry Patrick Landi, Yorktown Heights, and Vincent Anthony Perciaccante, Long Island City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sept. 20, 1976, Ser. No. 724,876

Int. Cl.[2] A61L *17/00*

U.S. Cl. 128—335.5 **17 Claims**



1. A non-absorbable surgical suture having improved knot run-down characteristics and reduced tissue drag comprising a polyfilamentary non-absorbable strand having thereon a thin lubricating coating of a lubricating absorbable co-polymer comprising polyoxyethylene blocks and polyoxypropylene blocks to aid run-down and handleability, said bioabsorbable copolymer having a molecular weight such that it is pasty to solid at 25° C.

4,043,345

CATHETER

Bernhard Kramann, Planegg, and Heinrich Tammen, Munich, both of Germany, assignors to Byk Gulden Lomberg Chemische Fabrik GmbH, Constance, Germany

Filed Apr. 28, 1975, Ser. No. 571,984

Claims priority, application Germany, May 2, 1974, 2421294

Int. Cl.[2] A61M *25/00*

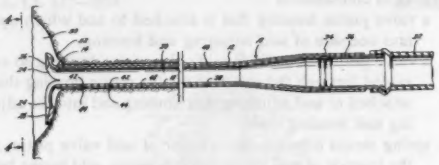
U.S. Cl. 128—349 R **12 Claims**

1. A catheter comprising a substantially rigid tube adapted to have fluid pressure introduced through one end thereof, a hose having a proximal end in fluid-tight engagement with the other end of said tube and a distal end, said hose being invaginated within said rigid tube, said hose being structured to be brought from an invaginated position into the exserted position by introduction of fluid pressure through said one end of said tube, and orifice means defined through wall portions of said hose at said distal end thereof, said wall portions having said orifice means defined therethrough being arranged in an overlapping abutting configuration to provide means creating a force to maintain said orifice means closed by maintaining said wall portions in said abutting relationship when said hose is in said invaginated position, said wall portions being configured to separate to release said abutting relationship thereby to open said orifice means when said hose is brought to said exerted position.

4,043,346
CATHETER

David F. Mobley, and Neil H. Baum, both of Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Filed Mar. 10, 1976, Ser. No. 665,647
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—349 R 14 Claims

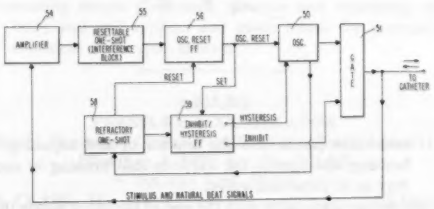


1. A catheter comprising,
a flexible outer tubular member having open inner and outer ends,
a flexible inner tubular member forming a flow duct snugly and slidably disposed within the outer tubular member, and
the inner tubular member having a rounded expansion tip at its inner end and being open at its outer end,
the expansion tip including a drain opening and being comprised of a plurality of prongs biased outwardly and operable to expand and open on inward movement of the inner tubular member in the outer tubular member to a position where the prongs are beyond the inner end of the outer member and to retract on movement of the inner tubular member outwardly in the outer tubular member to a position where at least a portion of the prongs are within the outer tubular member,
the outer end of the inner tubular member being extendable outwardly and inwardly of the outer end of the outer tubular member a distance sufficient for the movement of the inner tubular, member to expand and to retract the prongs.

4,043,347
MULTIPLE-FUNCTION DEMAND PACER WITH LOW CURRENT DRAIN

Alexis C. M. Renirie, Weezenhof, Netherlands, assignor to Vitatron Medical B.V., Dieren, Netherlands

Filed Aug. 28, 1975, Ser. No. 608,465
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 PG 3 Claims



1. Demand pacing apparatus for normally delivering stimulus pulses, and adapted to inhibit such delivery upon the detection of natural beats and to operate in combination with electrode means for delivering said stimulus signals to a patient and for delivering signals representative of natural beats in said patient to said pacing apparatus, comprising:
a. stimulus signal generating means, for normally generating periodic stimulus signals, having an oscillator adapted to be reset upon receipt of a reset signal;
b. a stimulus signal gating circuit, for gating said generated stimulus signals, said gating circuit having a first input connected to the output of said stimulus signal means, a second input for receiving an inhibit signal, and an output for connection to said electrode means, whereby gating of said stimulus signals through said gating circuit is inhibited when said inhibit signal is received;
c. signal amplifier means for amplifying inputted signals thereto;
d. transmission means for delivering stimulus signals from said gating circuit to said electrode means, for receiving said natural beat signals from said electrode means, and for connecting said stimulus signals and natural beat signals to said amplifier means;
e. logic means having inputs from said amplifier and said oscillator for determining when signals outputted from said amplifier represent detected natural signals, and for producing a reset signal only when one of said amplified signals represents a natural signal;
f. connecting means for connecting said reset signals to said stimulus generator, thereby resetting said oscillator only upon the occurrence of a natural signal;
g. inhibit means connected to said logic means and said stimulus signal generating means for providing an inhibit signal whenever said stimulus signal generator means is reset, and having an output connected to said gating circuit whereby said inhibit signal inhibits gating of the generated stimulus signal upon the occurrence of a natural signal;
h. said logic means containing interference block-out means for blocking production of said reset signal upon the detection of amplified signals having interruptions shorter than a predetermined interference time period;
i. said interference block-out means comprising a continuously settable multivibrator, said multivibrator having means for producing an output pulse of a predetermined duration when it receives a signal at its input, said multivibrator being reset to re-commence timing out said predetermined duration when a subsequent input signal is received within said interference period;
j. said logic means containing refractory means for inhibiting production of a reset signal for a predetermined refractory period following production of a signal by said stimulus signal generator means; and
k. said logic means contains a first flip-flop connected to and driven by said multivibrator, and a second multivibrator being characterized by producing a refractory pulse of said refractory period when an input signal is received, the input of said second multivibrator being connected to said stimulus signal generating means to receive an input signal when said stimulus signal generating means produces a signal, said first flip-flop being connected to be reset for the duration of each said refractory pulse, thereby inhibiting triggering thereof during said refractory period.

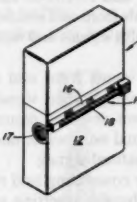
4,043,348
SMOKING PIPE TAMPER MEANS

Garland Harold Kanady, 201 Community Bldg., Ponca City, Okla. 74601

Filed Aug. 13, 1975, Ser. No. 604,160
Int. Cl.[2] A24F *3/02*
U.S. Cl. 131—243 4 Claims

1. An extendible pipe tamper for use with a rectangular lighter mechanism case, said pipe tamper comprising
a. a guide means, said guide means comprising a generally rectangular box having one of its sides open, said open side being adapted to functionally mate with an end of said rectangular case;
b. a guide tube means longitudinally positioned through said rectangular box, said guide tube means being positioned near the side opposite the open side of said rectangular box;
c. a narrow longitudinal slot positioned on a side of said rectangular box, said slot being in open communication with said guide tube means from a first end of said rectangular box to near a second end of said rectangular box;

d. an elongated body means slideably positioned in said guide tube means;
e. a tamper head means positioned on a first end of said elongated body means; and,
f. a thumb-engageable means positioned on a second end of



said elongated body means and extending through said slot

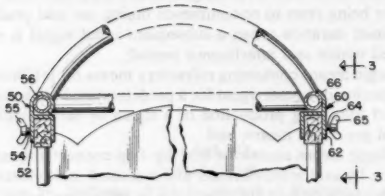
so that said tamper head means is extended by moving said thumb-engageable means toward said second end of said rectangular box and retracted by moving said thumb-engageable means toward said first end of said rectangular box.

4,043,349

REMOVABLE CRIB CANOPY

Susan Gays, 3198 Wilson St., and Anthony Romano, 3200 Wilson St., both of Hollywood, Fla. 33021

Filed Jan. 19, 1976, Ser. No. 650,511
Int. Cl.[2] A47C *29/00*
U.S. Cl. 135—5.3 **9 Claims**



1. Canopy apparatus for use in combination with a conventional child's crib, said apparatus comprising a frame including a plurality of support members interconnecting any two of said plurality of sides and a cover affixed to said sides and supported by said support members, said apparatus adapted to be mounted on and releasable secured to said crib by at least one pivot clamp, said pivot clamp including a generally U-shaped portion oppositely disposed from a generally semi-circular portion, said generally U-shaped portion adapted to grip on upper rail of one of a pair of opposed side walls of the crib and said generally semi-circular portion adapted to pivotally engage over one of said plurality of tubular sides of the frame, the portion of said tubular side being engaged by said semicircular portion capable of journaling therein along the longitudinal axis thereof.

4,043,350

EMERGENCY GAS SHUT-OFF UNIT MOUNTED ON GAS PRESSURE ADJUSTING UNIT

Shigeru Ichimi; Hideo Ichimi, and Kenjiro Funabashi, all of Aichi, Japan

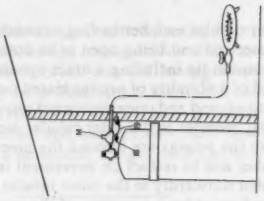
Filed Oct. 23, 1975, Ser. No. 625,274
Claims priority, application Japan, Nov. 13, 1974, 49-13738
Int. Cl.[2] F16K *17/36*
U.S. Cl. 137—39 **2 Claims**

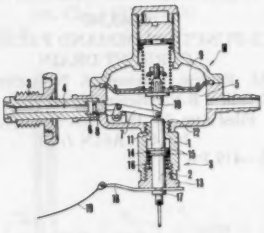
1. In the known combination of a gas cylinder and a gas pressure adjusting unit attached thereto which includes an adjusting unit housing, a gas inlet to said adjusting unit housing from said gas cylinder, a gas outlet from said adjusting unit housing, and a valve within said adjustment housing for controlling the admission of gas through said gas inlet into said adjustment unit housing, the improvement consisting of an emergency gas flow shut off device that will automatically cut off in the event the gas cylinder falls down because of an earthquake or other causes, said gas flow shut off device comprising in combination

a valve piston housing that is attached to and which opens into one side of said adjusting unit housing,

a valve piston mounted in said valve piston housing so as to extend through the end of the valve piston housing that is attached to said adjusting unit housing and into the adjusting unit housing itself,

spring means between the exterior of said valve piston and the interior of said valve piston housing, said spring being mounted with respect to said valve piston so as to urge





said valve piston into the interior of said adjusting unit housing and against the valve in said housing in such a way as to close said valve,

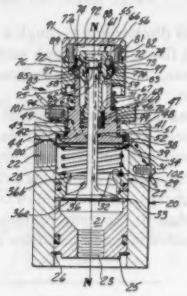
pin means engageable with the end of the valve piston that is opposite to the end of the valve piston that extends into the adjusting unit housing, and when said pin means is engaged with said end of the valve piston said spring means is in its compressed condition,

connector means connecting said pin means to a fixed wall, whereby, in the event that the gas cylinder falls down because of an earthquake or similar causes, the connector means will pull the pin means from engagement with the end of the valve piston and the thus released valve piston will move inwardly into the interor of said adjusting unit housing under the force exerted by said spring means and in moving inwardly will bear against the valve in the adjusting unit housing so as to close the gas inlet against further gas flow from said gas cylinder.

4,043,351
FLUID VALVE INCLUDING ELECTRICAL CIRCUIT CONTROL

Harold Durling, Elsie, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Nov. 26, 1975, Ser. No. 635,641
Int. Cl.[2] F16K 37/00
U.S. Cl. 137—554 6 Claims



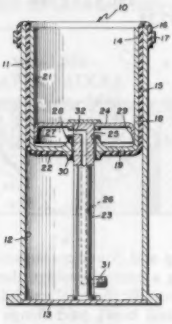
1. An electrical circuit controlling valve comprising:
a hollow body providing a passageway for fluid therethrough extending in its downstream direction from an inlet port to an outlet port;
valve seat means for a poppet valve member received in said body between said ports having its seating surface facing downstream of said passageway;
a poppet valve member comprising a head and a stem;
valve support and guide means in slidable engagement with said stem comprising electrically conductive means electrically connecting said valve and said support and guide means;
said body and said valve seat means comprising electrically conductive means electrically connecting one to the other;
means for attaching said body to said guide and support means to align said member for reciprocation effecting closed and opened positions of seating and spacing, respectively, of the head with respect to said seating surface;
latching mechanism in said valve support and guide means interacting with said stem to retain and release said valve member;
insulating means positioned between and separating said body and said support and guide means for preventing electrical connection thereof.

4,043,352
PRESSURE ACCUMULATOR

Alden H. Simpson, 54 Pine Grove St., Springfield, Mass. 01119

Filed Aug. 5, 1976, Ser. No. 712,035
Int. Cl.[2] F16L 55/04
U.S. Cl. 138—31 5 Claims

1. A pressure accumulator, comprising
a. a main housing having a cylindrical inner surface, having a closure at one end and open at the other,
b. an elastomer bag lying within the housing with an edge fixed to the said open end thereof,
c. an open-ended vessel lying within the housing having a flat bottom extending across the housing and having a tubular side wall, substantial portions of the bag being located between the said cylindrical surface of the housing and the outer surface of the tubular side wall, the bottom of the bag lying against the outer surface of the bottom of the said vessel,
d. a post which is fixed to the closure at the said one end of the housing and which extends axially of the said cylindrical surface, the post extending through an aperture in the bottom of the bag and of the vessel,
e. a piston fixed to the free end of the post and having its outer periphery slideably engaging the inner surface of the vessel, and

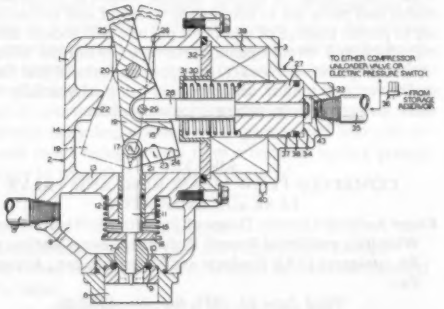


f. means for the passage of pressure fluid into the chamber defined by the said piston and the inner surface of the said vessel.

4,043,353
MANUALLY, PNEUMATICALLY, OR ELECTRICALLY OPERABLE DRAIN VALVE DEVICE

Frank W. Shirey, North Huntingdon Township, Westmoreland County, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Aug. 2, 1976, Ser. No. 710,555
Int. Cl.[2] F16T 1/00; F16K 31/05
U.S. Cl. 137—204 10 Claims



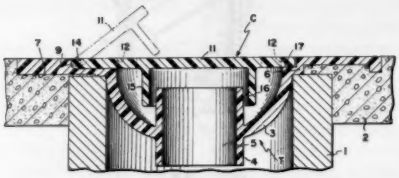
1. A drain valve device for collecting and expelling moisture condensate from a compressed air system, said drain valve device comprising:
a. a casing having formed therein a valve chamber connectable to the compressed air system for collecting moisture condensate therefrom;
b. valve means in said chamber normally occupying a seated disposition in which the chamber is closed to atmosphere, and being operable to an unseated disposition for opening the chamber and expelling the moisture condensate therein to atmosphere;
c. cam means connected to said valve means and alternately movable in opposite directions for operating said valve means to its said unseated disposition each time said cam means moves in each of said opposite directions; and
d. operating means normally biased toward a first position for moving said cam means in one of said opposite directions, and effective, when actuated, for moving said cam means in the other of said opposite directions.

4,043,354

DRAIN TRAP AND COVER CONSTRUCTION

Douglas S. Brown, Vassar, Mich., assignor to D & J Tool & Die, Inc., Vassar, Mich.

Filed May 17, 1976, Ser. No. 687,364
Int. Cl.[2] F16K *9/00*
U.S. Cl. 137—247.33 **4 Claims**



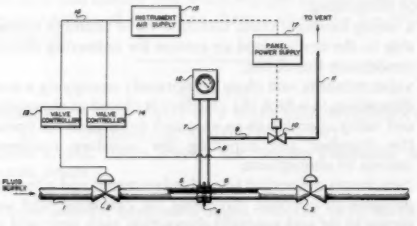
1. A drain trap and cover construction comprising an open top bowl having a central passage therein; a marginal flange formed of non-metallic material extending outwardly from the upper edge of said bowl, said flange having a substantially cylindrical socket formed therein with a throat opening leading thereinto from the upper surface of said flange, said throat opening having a length corresponding to that of said socket and having a normal width less than the diameter of said socket, said flange having a channel in its upper surface extending from said socket to the upper edge of said bowl, said channel having a width less than the length of said socket and said socket extending at both ends thereof beyond said channel; a non-metallic cover for said bowl; and an integral tongue extending from said cover and terminating in a substantially cylindrical pivot pin rotatably accommodated in said socket, said tongue having a length, width and thickness corresponding substantially to the length, width and depth of said channel and said pivot pin having a length and diameter corresponding to the length and diameter of said socket but having a diameter greater than the width of said throat opening, the material from which said flange is formed having sufficient resilience to enable said pivot pin to enlarge the width of said throat opening to permit passage of said pivot pin into said socket, following which said throat opening returns to its normal width to retain said pin in said socket, the upper surfaces of said flange, said cover, said tongue, said pivot pin being substantially flush when said cover is in its bowl-closing position.

4,043,355

COMBINED FLOW MEASURING AND VALVE LEAKAGE INDICATOR

Roger Anthony Cerruti; Thomas Ellsworth McWhorter, both of Whitehall, and David Russell Ruprecht, Laurys Station, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed June 22, 1976, Ser. No. 698,625
Int. Cl.[2] G01M *3/28*
U.S. Cl. 137—312 **6 Claims**



1. In an apparatus for controlling and measuring the flow rate of a fluid in a conduit of the type having first and second flow control valves with a flow sensing device of the differential pressure type located in the conduit between the control valves and flow indicating means of the differential pressure type connected to said flow sensing device through a high pressure conduit and a low pressure conduit, the improvement for detecting fluid leakage past the control valves into the conduit between the control valves when said first and second valves are in closed position comprising:

a vent conduit communicating with said low pressure conduit at a point between the connection of the low pressure conduit to the flow sensing device and the point of connection of the low pressure conduit to the flow indicating means;

said vent conduit discharging through a vent valve normally closed during fluid flow through said fluid conduit; and

means to open said vent valve in response to closing of said control valves,

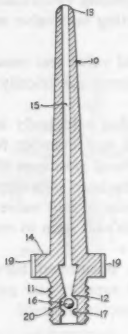
whereby fluid leakage past said control valves into the fluid conduit between said control valves discharges through the low pressure conduit causing a pressure drop between the point of connection of the low pressure conduit to the flow sensing means and the point of connection of the low pressure conduit to the vent conduit, said pressure drop causing a positive indication of flow on said flow indicating means.

4,043,356

INFLATING PROBE

Ralph Morris, Clontarf, and William Gordon Turner, Balgowlah, both of Australia, assignors to Morris Turner Pty. Limited, Balgowlah, Australia

Filed July 19, 1976, Ser. No. 706,788
Claims priority, application Australia, Aug. 20, 1975, 2870/75; Apr. 27, 1976, 13404/76
Int. Cl.[2] F16K *43/00*
U.S. Cl. 137—320 **4 Claims**



1. An inflator probe for filling gas containers and the like comprising

a. a one-piece body molded from a suitable plastic material,

b. said body providing a circumferentially extending shoulder having on one side an externally threaded cylindrical end piece for attachment to a pump,

c. an elongated probe extending from the other side of said shoulder tapered in the direction of its length and providing a center bore therethrough,

d. a chamber formed in and opening out of said cylindrical end piece,

e. a ball valve within said chamber having a diameter less than that of said chamber,

f. a non-circular restricted throat providing communication between said chamber and said center bore of said probe and of a size less than the diameter of said ball valve, and

g. an internal collar within said chamber between said open end thereof and said restricted throat forming a seat for said ball valve,

h. said collar having sufficient resiliency to permit insertion

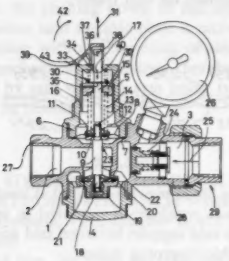
and retention of said ball valve in said chamber after said probe has been molded.

4,043,357

FILTER FITTING FOR HEATING INSTALLATIONS

Eberhard Wilhelm Gocke, Mosbach, Germany, assignor to Braukmann Armaturen AG, Rothrist, Switzerland

Filed Sept. 17, 1975, Ser. No. 614,247
Int. Cl.² F16K *31/14*
U.S. Cl. 137—495 **2 Claims**



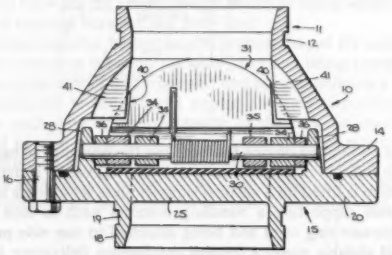
1. A filler fitting especially for heating installations having a housing, an inlet and an outlet to said housing, a pressure-reducer between said inlet and outlet, said pressure-reducer having a valve mechanism which is spring loaded towards an open position, means additionally loading said valve mechanism in the direction of opening and releasable means for disconnecting said additional means, said valve mechanism including a valve stem and said additional means comprises a pin with a spring biasing said pin against said valve stem the spring acting on said valve stem and the spring biasing said pin being co-axial, said pin having a non circular cross section, a plate in said housing adapted for threaded movement thereon, said plate having an aperture corresponding to said non circular section of said pin passing through said aperture, said plate serving to support the said spring acting on said valve stem.

4,043,358

FLAPPER CHECK VALVE

Chester Sliski, Trenton, N.J., assignor to Victaulic Company of America, South Plainfield, N.J.

Filed Feb. 2, 1976, Ser. No. 654,626
Int. Cl.² F16K *15/03*
U.S. Cl. 137—512.1 **12 Claims**



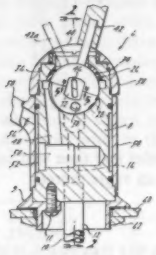
1. A check valve comprising a valve body formed in two parts, a downstream part of said valve body defining a generally bell-shaped flow chamber and an outlet from said flow chamber, and an upstream part of said valve body including an inlet and a shaft mounted transversely with respect to said inlet, said shaft carrying a pair of half-discs mounted for movement from a generally coplanar closed position with said half-discs in contact with a valve seat formed in said upstream valve part to a fully open position with said half-discs resting against stop means within said downstream part of the valve body and wherein said stop means comprise a pair of projections integrally formed with the downstream part of the valve body and said half-discs have recesses located to mate with said projection, and including means allowing said half-discs to move into back-to-back contact when the valve is in fully open condition.

4,043,359

WATER FAUCET

Christ Christo, Farmington Hills, Mich., assignor to Masco Corporation of Indiana, Greensburg, Ind.

Filed May 5, 1976, Ser. No. 683,264
Int. Cl.² F16K *11/087*
U.S. Cl. 137—625.41 **5 Claims**



1. A water faucet including a valve body having an inlet duct connectable to a source of water and an outlet duct, valve means within said body selectively movable to interconnect said inlet and outlet ducts and to isolate said inlet and outlet ducts, a manually operable handle extending from said body and connected to said valve means for movement of said valve means, stationary stop means connected to said valve body and limiting the range of movement of said valve means, the improvement comprising: said valve means being an arcuate valve member formed from plastic material and having a recess formed therein, said stop means protruding from said valve body and being received in said recess, and an insert member having an aperture therethrough mounted in said recess, said stop means extending through said aperture and into said recess, said insert being formed from a material having greater resistance to wear than said plastic material.

4,043,360

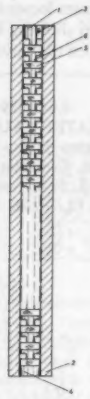
PRESSURE REDUCING DEVICE FOR FLUIDS

Baruch Yaron, Givatayim, Israel, assignor to Incontrol Ltd., Tel Aviv, Israel

Filed July 16, 1975, Ser. No. 596,455
Int. Cl.² F15D *1/02*
U.S. Cl. 138—42 **6 Claims**

1. A device for reducing pressure in a fluid flow directed in a path along the length of the device from an inlet end to an outlet end, said device comprising an elongated body, the length of said body being divided into a plurality of adjacent chambers formed about the periphery of said body, each chamber comprising a series of peripheral adjacent grooves formed in the periphery of said body transversely of the length of said body, the adjacent grooves being in communication with each other and advancing, by communicating steps, along the length of said body toward the outlet end, the grooves of each chamber, beyond a first groove closest to the inlet end, each being oriented at a propressively greater angle to the first groove about the periphery of said body with the grooves of each chamber defining a path for the flow of fluid about the periphery of the length of said body, the last groove of each chamber being closer to the inlet end than the preceding groove in the same chamber and communicating with the first

groove of the next adjacent chamber toward the outlet end with said first groove of the next adjacent chamber being



closer to said outlet end than said last groove of the previous chamber and at an angle thereto.

4,043,361

APPARATUS TO DELIVER WEFT TO FLUID WEFT INSERTING MEANS

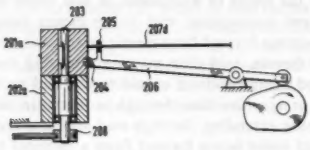
Walter Scheffel, Industriestr. 53, 8832 Weissenburg, Germany

Division of Ser. No. 430,303, Jan. 2, 1974, abandoned. This application June 21, 1976, Ser. No. 697,782

Claims priority, application Germany, Apr. 4, 1973, 2316734; June 2, 1973, 2328135

Int. Cl.[2] D03D *47/34*

U.S. Cl. 139—452 **5 Claims**



1. Apparatus for the insertion of a weft thread in the shed of warp threads in a weaving machine having means to propel and decelerate the weft and a weft supply arranged outside the shed in which the weft is alternately guided around a rotating drum and a coaxial stationary drum in which a thread guide is movable in the axial direction of at least two coaxial drums arranged close together and in which at least one of the drums is imparted a constant rotation by a drive.

4,043,362

CUTTING AND INSULATION STRIPPING APPARATUS FOR TWISTED WIRE PAIR

Robert B. Senior, Grand Haven, and Frederick Karasinski, Grand Rapids, both of Mich., assignors to Gardner-Denver Company, Dallas, Tex.

Filed Feb. 9, 1976, Ser. No. 656,239

Int. Cl.[2] B21F *7/00*

U.S. Cl. 140—1 **20 Claims**

1. Apparatus for preparing a predetermined length of insulated and pretwisted electrical conductor wire pair and for cutting and stripping insulation from at least one set of adjacent end portions of said length of wire pair, comprising:

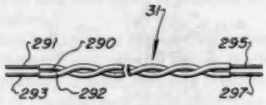
a frame;

a feed mechanism disposed on said frame engageable with said wire pair for feeding a predetermined length of wire pair substantially linearly with respect to said frame preparatory to cutting said wire and said insulation;

a wire gripping device supported on said frame beyond said feed mechanism in the direction of feeding of said wire pair and including movable jaw portions for releasably gripping said wire pair;

wire untwisting means disposed on said frame and spaced apart from said gripping device and including rotatable clamping means for clamping and rotating said wire pair to form an untwisted section of said wire pair between said rotatable clamping means and said gripping device;

a support disposed on said frame;



a wire cutting blade mechanism and at least a first insulation cutting blade mechanism mounted in spaced apart relationship on said support between said gripping device and said rotatable clamping means;

means for actuating said blade mechanisms to cut said wire and said insulation on said untwisted section of said wire pair; and,

means for moving said adjacent end portions of said wire pair with respect to said insulation cutting blade mechanism after said insulation is cut to strip the insulation from said end portions.

4,043,363

BINDING DEVICE FOR BUNDLING OPENINGS OF BAGS OR THE LIKE

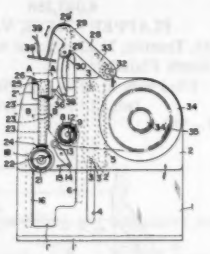
Fumiko Tange, 39-231, Aza Takane, Oaza Okehazama, Arimatsu-cho, Midori, Nagoya, Japan

Filed Dec. 6, 1976, Ser. No. 747,688

Claims priority, application Japan, Dec. 11, 1975, 50-148099

Int. Cl.[2] B21F *15/04*

U.S. Cl. 140—93 A **4 Claims**



1. A binding device for bundling the openings of bags or the like which comprises: a vertically movable slidable plate which is fitted on a vertical support plate set up on a bed plate; a reel supporting a bundling material such as iron wire or wire-carrying cord and being attached to one side portion of said slidable plate; a feeding mechanism delivering said bundling material and being formed in the other side portion of said slidable plate; a twisting mechanism positioned in front of said feeding mechanism, said twisting mechanism holding said bundling material with supporting pawls and twisting said bundling material when said slidable plate is moved down; rocking arms the root ends of which are pivoted to the upper portion of said slidable plate above said twisting mechanism; U-shaped carriers attached to the free ends of said rocking arms to receive the material to be bound; a movable winding arm attached in the middle gap between said rocking arms, said

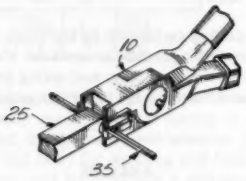
winding arm guiding and winding said bundling material; a rack projected from said slidable plate and engaged with a sector gear formed at the pivoted end of said winding arm to rotate said winding arm; and an arcuate push rod attached at the lower portions of said rocking arms, the lower end of said push rod being in engagement with a cutting blade which is attached to the side of a supporting member attached to the upper end of said twisting mechanism; and said device being characterized in that a certain length of said bundling material delivered to said twisting mechanism is cut off by said cutting blade interlocked with the movement of said rocking arms when material to be bound in said U-shaped carriers is moved down, and with the pushing down of the upper side of said twisting mechanism, said slidable plate is moved down and in interlocked relation with the lowering of said slidable plate, said twisting mechanism is rotated, thereby said bundling material wound by said winding arm being twisted to bundle said material to be bound.

4,043,364

PLIER SET FOR MAKING TORQUING BENDS IN ORTHODONTIC ARCH WIRES

Larry A. Rose, Houston, Tex., assignor to E.T.M. Corporation, Monrovia, Calif.

Filed Nov. 24, 1976, Ser. No. 744,597
Int. Cl.[2] B21F *1/00, 7/00;* **B21D** *11/14;* **A61C** *7/00*
U.S. Cl. 140—106 **8 Claims**



1. A wire-bending plier set for use with orthodontic arch wire of non-circular cross section, comprising:

a plier with a pair of hinged arms having handles and opposed tip portions, the arms being pivotally movable with respect to each other about a hinge axis disposed between the handles and tip portions, each tip portion having a pair of gripping jaws which are spaced apart in a direction parallel to the hinge axis, the pairs of jaws being aligned so the arch wire can be gripped at two axially spaced positions between the jaw pairs with a central portion of the wire between the axially spaced positions being supported and exposed between the jaws; and

a bending member having an end portion shaped for removable insertion between the plier jaws and being rotatable about the axis of said wire, said end portion defining a slot configured to receive and engage the central portion of the arch wire whereby rotation of the bending member end portion about the wire axis, when said end portion is positioned between said jaws, will twist the central portion with respect to the axially spaced positions to form a torquing bend in the central portion of the arch wire.

4,043,365

AUTOMATIC SCREW DRIVER HAVING BRAKE RESPONSIVE BALL CLUTCH MEANS

George York, 1232C Sunset Lane, Martinsville, N.J. 08836

Filed May 18, 1976, Ser. No. 687,637
Int. Cl.[2] B25B *23/4;* **F16D** *7/00*
U.S. Cl. 144—32 R **11 Claims**

1. A screw driver apparatus comprising:

a. base support means;

b. rotational drive means including:

a drive motor,

a rotary spindle, and

transfer means for transmitting rotary motion of said drive motor to cause rotary motion in said rotary spindle;

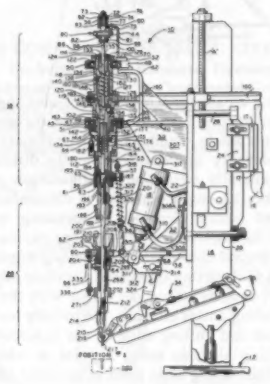
c. drive shaft means mounted for both rotational and reciprocating motion;

d. a driver bit rigidly mounted on said drive shaft means for rotating and reciprocating therewith, said drive bit for engaging a screw to be driven by said screw driver;

e. spline drive means connecting said drive shaft means with said rotational drive means whereby to permit transfer of rotational motion to said drive shaft means notwithstanding concurrent reciprocating of said drive shaft means;

f. ball clutch means disposed between said rotational drive means and said spline drive means, said ball clutch transmitting rotational motion from said rotational drive means to said spline drive means when engaged and permitting independent rotation of said rotational drive means with respect to said spline drive means when disengaged;

g. brake means rigidly secured to said drive shaft means, said brake means including a shoe mounting element and a brake shoe rigidly secured to said shoe mounting element, said shoe mounting element being selectively positionable on said drive shaft whereby to adjust the amount of advancement of said drive bit prior to the occurrence of



braking by said brake means, and further including a brake drum means mounted on said base support means for cooperating with said brake shoe to brake said drive shaft, said brake means for arresting rotational motion of said drive shaft means upon the occurrence of full advancement of said drive bit, said ball clutch means being disengageable in response to the arrest of rotational motion of said drive shaft means by said brake means; and

h. reciprocating motor means for imparting reciprocating motion to said drive shaft means and therewith said drive bit.

8. Clutch means for operationally connecting a first rotating member and a second rotating member, said second rotating member being supported for both rotational and reciprocating motion, said clutch means comprising:

a plurality of arcuately spaced radially extending bores formed in said first rotating member;

a plurality of arcuately spaced radially extending bores formed in said second rotating member, said arcuate spacing of said bores in said second member corresponding in arcuate displacement to said arcuate displacement of said bores formed in said first rotating member, thereby to permit alignment of said bores of said first and second rotating members;

a plurality of ball elements, said plurality of ball elements being equal in number to the number of radially extending

bores formed in said second rotating member, each of said ball elements being larger in diameter than the diameter of said bores formed in said first rotating member and smaller in diameter than said bores formed in said second rotating member; and

means for urging said plurality of balls radially outwardly through said bores in said second rotating member and into said bores in first rotatinng member.

4,043,366

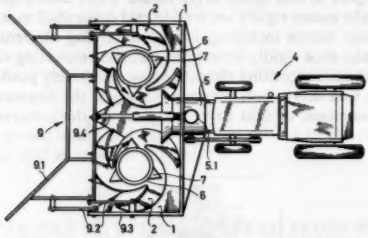
CLEARING MACHINE FOR BRUSHWOOD

Kyosti Pallari, 95385 Tervola, Finland

Continuation-in-part of Ser. No. 531,044, Dec. 9, 1974, Pat. No. 3,996,980. This application Apr. 21, 1976, Ser. No. 678,988

Int. Cl.[2] A01G *23/08*

U.S. Cl. 144—34 E **2 Claims**



1. Shearing means for a machine for clearing brushwood or the like comprising a stationary plate member and a rotor having rotary blade members, said stationary plate member having a plurality of circumferentially disposed cutter elements of generally triangular configuration and said rotary blade member having a plurality of circumferentially spaced sickle-shaped cutter elements cooperating with the cutter elements of the stationary plate member having a cutting edge, said sickle-shaped cutter elements having a leading edge coincident with said cutting edge and a trailing edge, said trailing edge being convexly curved to merge with the root end of the adjacent trailing cutter element, the joinder between said trailing edge and said cutting edge of the adjacent trailing sickle-shaped cutting element being a point at which said cutting edge and said trailing edge meet at an acute angle, said sickle-shaped cutting elements projecting in a circumferential direction in such a manner that they form with the generally triangular cutter elements enclosed areas, being arranged to progressively decrease in size as the sickle-shaped elements are rotated relative to the stationary plate with cutting points, defined by instantaneous points of contact between cutting edges of said sickle-shaped elements and the associated edges of the stationary plate members, moving from a location adjacent the tips of the stationary cutter elements toward their bases, each of said sickle-shaped cutter elements defining a concavely curved cutting edge extending in a generally radially-circumferential direction along a curve which is concave with respect to the center of rotation of said rotor, the angle between a tangent touching said curve at any tangent point thereof, and a radial line passing through the center of rotation of said rotor being 50° to 80°.

4,043,367

REMOVABLE CUTTING ELEMENTS

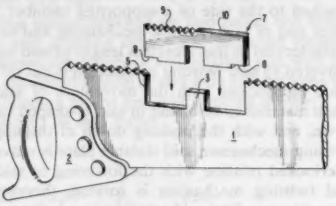
Eugene W. Knuth, Land O Lakes, Wis. 54540

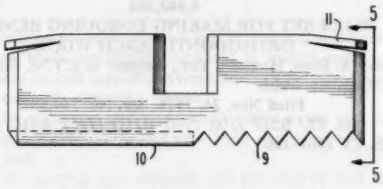
Filed Feb. 18, 1976, Ser. No. 659,118

Int. Cl.[2] B27B *21/00*

U.S. Cl. 145—31 R **2 Claims**

1. A saw body comprising parallel planar wall portions having at least one cutting surface along one edge thereof, said cutting surface having a recessed area of substantially rectangular configuration with a planar edge parallel to said cutting surface and V-shaped walls extending orthogonally from said planar edge to said cutting surface, an upwardly extending substantially rectangular tang medially disposed on said planar edge with V-shaped walls and a planar top portion, and a cutting element disposed in said recessed area overlying said





tang having a cutting surface on its top edge, V-shaped walls on its side edges to tangentially contact the V-shaped walls of said recessed area and said tang, and spring projections on its substantially planar bottom edge to further grip the walls of said recessed area.

4,043,368

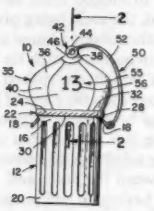
ADJUSTABLE GARBAGE CAN COVER

John M. Forte, Sr., 13 Colfax Drive, Pequannock, N.J. 07440

Filed May 12, 1976, Ser. No. 685,618

Int. Cl.[2] B65D *55/16*

U.S. Cl. 150—52 R **3 Claims**



1. A cover for use with a garbage can having a handle and an open upper end comprising:

A. elastic coupling means including an elastic band that is adapted to be stretched into surrounding circumferential relation with the open upper end of the garbage can and collapsed when the cover is removed and stored,

B. flexible hood means having a top end and a bottom end, said bottom end peripherally secured to said elastic means at one end thereof so that the open end of the garbage can is covered by said hood means,

C. said hood portion comprising an expandable body including circumferentially a plurality of elongate arcuate elastic interconnected panels that extend first generally axially and then mutually inwardly and joined at the upper edge to said top end, said hood adapted to be collapsed into a folded elongated position when the cover is removed from the can and into a dome in the open position extending above said elastic band,

D. gripping means connected to the upper end of said flexible hood means at said upper edge of said panels,

E. said gripping means including a ring adapted to be gripped in removing the cover from the can,

F. connecting means coupled to said gripping means at one end thereof and adapted to be secured to the handle of the can, and

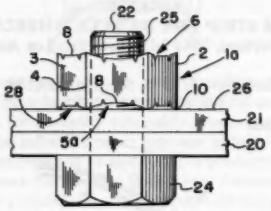
G. said connecting means being in the form of an elongated flexible member extending from said ring of said gripping means and of a length for securement to the handle of the can.

4,043,369

EDGE DEFORMABLE LOCK NUT

Robert R. Abernethy, 7295 Walton Road, Walton Hills, Ohio 44116

Filed Mar. 11, 1976, Ser. No. 665,918
Int. Cl.[2] F16B *39/12, 29/28*
U.S. Cl. 151—21 C **9 Claims**



1. A lock nut positionable on a male threaded member, comprising a body made of metal having a relatively soft interior core and a relatively hard exterior, threaded bore means through said body for securing said lock nut to a male threaded member, said body having a plurality of side faces and opposite end faces, adjacent pairs of said side faces joining at respective corners and defining a generally polygonal shape perimeter for at least one of said end faces of said body, said one end face of said body having a generally annular dished portion commencing at said corners as relatively high points and recessing into said body toward said bore means, said corner high points being relatively hard and thinned for biting and spreading into a confronting surface as said lock nut is tightened on such male threaded member and providing first fulcrum points at which force is applied by such confronting surface to yieldably deform said relatively soft interior core of said body to lock said nut substantially uniformly onto such member.

4,043,370

SEAL ARRANGEMENT FOR AN OVAL TIRE AND RIM

William B. Unwin; John J. Groezinger, and Charles E. Grawey, all of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 26, 1976, Ser. No. 652,260
Int. Cl.[2] B60C *19/00*
U.S. Cl. 152—354 **6 Claims**

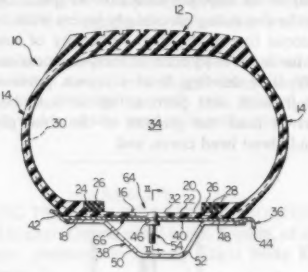
1. A seal arrangement for an oval tire and rim comprising:

a tubeless oval tire having an outer tread portion, a pair of sidewalls, and an annular base extending axially between said sidewalls, said annular base having a radially inner mounting surface and an air inlet passage therethrough leading to an internal air chamber;

a supporting rim having a substantially cylindrical body portion and a radially outer mounting surface on said body portion disposed in facing relation with said inner mounting surface of said tire and with a valve opening therethrough alignable with said passage;

a valve stem member extending through said valve opening and being sealed against the rim, said valve stem member being disposed substantially within said air inlet passage and spaced from said tire; and

a sealing ridge associated with said inner mounting surface of said tire and encompassing said air inlet passage and



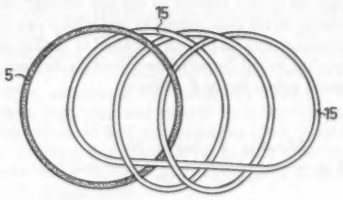
being immediately adjacent thereto and of a construction sufficient for multiplying the effective unit loading between said tire and said rim caused by pressure in said chamber and for forming a seal therebetween immediately about said air inlet passage and said valve opening.

4,043,371

BEAD CORE FOR PNEUMATIC TIRES

Henryk Pakur, Buckeburg, and Reinhard Tiemann, Hemmingen, both of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

Filed Apr. 27, 1976, Ser. No. 680,886
Claims priority, application Germany, Apr. 29, 1975, 2518934
Int. Cl.[2] B60C *15/04*
U.S. Cl. 152—362 R **4 Claims**



1. A tire having a bead core composed of thread-shaped strength carrier means closed in a looped manner and comprising a plurality of windings interlocking with each other to form the strength carrier means having as an improvement in combination therewith at least one annular member separately closed in itself and comprising winding ring means interlocked with said strength carrier means to fix the peripheral diameter by holding the windings together with a high degree of Precision with regard to the circular shape and dimension of the finished condition of the bead core.

4,043,372

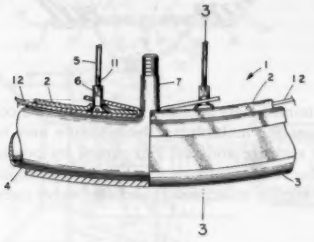
PNEUMATIC TIRE FOR OFF-ROAD VEHICLES

Isao Miyoshi, Kodaira; Masaru Abe, Sayama; Toshiro Tezuka, Higashi-Murayama, and Toshio Yoshimoto, Akigawa, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Mar. 5, 1976, Ser. No. 664,227
Claims priority, application Japan, Mar. 15, 1975, 50-31579
Int. Cl.[2] B60C *9/10, 9/18*
U.S. Cl. 152—354 **5 Claims**

1. A pneumatic tire for off-road vehicles, which is highly durable under heavy load conditions, comprising:

a carcass body composed of a plurality of rubberized ply layers superimposed one upon the other and each containing organic fiber cords embedded therein and assembled into a bias construction in which the organic fiber cords of substantially one-half of the carcass ply layers are extended in an opposite direction to the cords associated with the remaining carcass ply layers with respect to the equatorial line of the tire, a plurality of bead members, each having a bead core, at least one portion of the total ply layers extending from a crown portion of the tire through both side portions up to both bead members where at least one portion of the total ply layers are wound about bead cores, and



a breaker superimposed about the crown center portion of said carcass body and composed of at least one rubberized layer containing reinforcing elements embedded therein and formed of material having a tensile strength of at least 140 Kg/mm², the number of plies of said plurality of rubberized ply layers in said carcass body which extend from the crown portion of the tire through the side portions up to the bead members and which can substantially withstand internal pressure applied to the tire and external force subjected thereto determined on the basis of a fundamental safety factor ξ wherein:

$$\xi = \frac{2T_C \cdot R_M \sum_{i=1}^{n} (\sin^2\alpha_n \cdot Nn)}{5P(R_M^2 - R_r^2)} = 6 \text{ to } 8$$

and which lies within a range of a correction safety factor η; η governed by the use and type of the tire and the depth of tread groove and which is given by

$$\eta = K_1 \cdot K_2 \cdot K_3 \cdot \xi$$

where

T_C is a tensile strength of a cord (Kg/1 cord),

P is a standard internal pressure defined by JIS D6401 or an internal pressure recommended by TRA YEAR BOOK published in U.S.A. for tires with sizes not defined by JIS (Kg/cm²),

Nn is number of cords per 5 cm of each ply (Number of cords/5 cm),

α_n is an angle of cords in each ply inclined with respect to the equatorial line of the tire (°),

R_M is a distance from the rotational axis of the tire to the innermost ply of the carcass body at the crown portion of the tire (cm),

R_r is $(R_M + R_R)/2$ where R_R is a radius of a rim (if the rim diameter in inch is odd number, (the rim diameter − 1) × 2.54 = $2R_R$) (cm),

n is number of the carcass plies which can withstand the internal pressure applied to the tire and the external force subjected thereto,

K_1 is a coefficient having a value in dependence with the use of the tire:

The 1st kind of tire for construction vehicles defined by DIS 6401: 1.6

The 3rd kind of tire for construction vehicles defined by DIS 6401: 1.0

Tire for industrial vehicle defined by DIS 6401: 1.0

K_2 is a coefficient having a value in dependence with the type of tire:

Ordinary tire: 1.0

An aspect ratio H/S=0.87 to 1.0 for regular tread,

Wide base tire: 1.1

An aspect ratio H/S <0.87 for regular tread, and

K_3 is a coefficient having a value in dependence with the depth of tread groove:

Regular tread: 1

Extra tread: 1.1

Extra deep tread: 1.1,

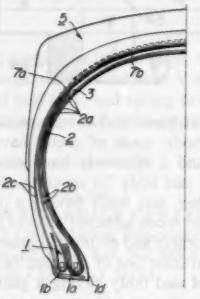
K_2 and K_3 being always 1 for tire for industrial vehicles.

4,043,373

RIM STRIP FOR BICYCLE WHEELS

Roger Owen Durham, 3944 Marathon St., Los Angeles, Calif. 90029

Filed Nov. 5, 1975, Ser. No. 629,139
Int. Cl.² B60C *19/00*
U.S. Cl. 152—365 **4 Claims**



1. In a wheel having spokes with threaded outward ends, a rim with spoke nipple holes, spoke nipples inserted through said spoke nipple holes in said rim and engaging said threaded outward ends of said spokes, and an inflatable tube with a tube valve stem the combination of:

a. a valve stem hole in said rim adaptable for insertion of said tube valve stem and the free ends of a flexible rim strip;

b. a flexible rim strip having two free ends with a rim strip securing means near each free end, said free ends adapted for insertion through said valve stem hole in said rim, with said rim strip securing means engaging said spoke nipples adjacent said valve stem hole in said rim.

4,043,374

WHEEL RIM ASSEMBLY AND METHOD FOR DEMOUNTING A TIRE THEREFROM

Duane R. Smith, Oswego, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 17, 1975, Ser. No. 641,461
Int. Cl.² B60B *25/00*; B60C *5/00*
U.S. Cl. 152—405 **24 Claims**

1. A rim assembly having an air-inflated tire mounted thereon and disposed for rotation about a longitudinal axis thereof, said rim assembly comprising

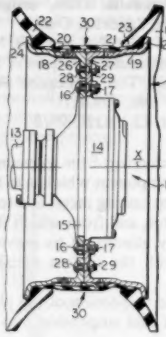
a pair of annular first and second rim sections defining coaxially aligned peripheral portions mounting said tire thereon,

a rim flange secured on an outboard end of each of said first and second rim sections to extend radially outwardly

therefrom and away from said axis to retain said tire on said rim assembly,

first and second mounting flanges secured on an inboard end of said first and second rim sections, respectively, to extend radially inwardly therefrom and towards said axis,

fastening means releasably attaching said first and second mounting flanges together, and



latch means mounted on and straddling the co-axially aligned peripheral portions of said first and second rim sections for normally releasably attaching them together under the influence of air pressure in said tire and releasable upon inflation of said tire to a predetermined level of air pressure therein, said latch means disposed on the outer periphery of said rim assembly and interiorly of said tire to be directly acted upon by air pressure in the said tire.

4,043,375

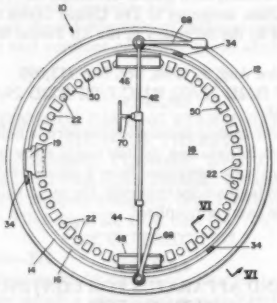
RIM CONSTRUCTION AND TOOL APPARATUS FOR SAFE TIRE INFLATION

Robert Casey, Tazewell County, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 626,422, Oct. 28, 1975, Pat. No. 3,995,676. This application June 16, 1976, Ser. No. 696,656

Int. Cl.[2] B60C *25/00, 5/16*

U.S. Cl. 157—1 **2 Claims**



1. In combination with a multi-piece wheel assembly including a rim base member, a pair of flange members removably associated at either end thereof and formed to have an inflatable tire mounted therebetween, the rim base member defining first and second annular grooves circumferentially oriented adjacent one end, said first annular groove proximate said end, a lock ring removably adapted to fit and positionable in said first annular groove, a seal member positioned in said second annular groove, and a bead seat band formed to receive one flange member and mountable on said rim base member inwardly of said first annular groove and overlying said seal member, said lock ring for retaining said bead seat band on said rim base member; said bead seat band defining a plurality of radial ports to communicate the interior of a mounted and inflated tire with atmospheric air, said port sealed by said seal member to block said communication between the interior of said mounted tire and atmospheric air only while said bead seat band is urged against said lock ring with said lock ring seated in said first annular groove, a puller apparatus comprising:

a support structure engageable with said wheel assembly, and

puller means associated with said support structure,

said puller means operatively engageable with the wheel assembly and cooperating with said support structure for urging said bead seat band outwardly against said lock ring.

4,043,376

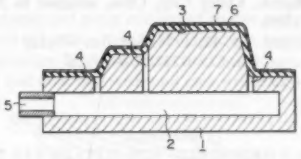
CASTING PROCESS BY VACUUM MOLDING

Yuuji Kasai; Hironuri Ogura, and Atsushi Toyoda, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed June 16, 1976, Ser. No. 696,628

Int. Cl.[2] B22C *9/02, 3/00, 1/22*

U.S. Cl. 164—7 **11 Claims**



1. Improved casting process by vacuum molding comprising, in sequential combination, tightly covering a pattern surface of a pattern with a covering film by suction applied to said pattern surface, coating the exposed surface of said covering film with solution of an initial condensate of a thermosetting resin in order to form a thermosetting resin layer on said covering film, placing a molding box in position on said covered pattern surface, filling a center cavity of said molding box with a fluid refractory filler, closing the exposed surface of said refractory filler, solidifying said refractory filler by suction applied thereto, removing said pattern from the remainder in order to form one mold half, preparing the other mold half in similar way, coupling said mold halves to each other in order to form a mold having an inner cavity and casting molten metal into said cavity of said mold.

4,043,377

METHOD FOR CASTING METAL ALLOYS

Khodabakhsh S. Mazdiyasni, Xenia, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 20, 1976, Ser. No. 716,303

Int. Cl.[2] B22C *3/00, 9/10*

U.S. Cl. 164—7 **11 Claims**

1. A method for casting eutectic composition nickel base superalloys to form a hollow article which comprises introducing molten eutectic composition nickel base superalloy into a mold containing a core body fabricated from titanium nitride, the mold being maintained under a vacuum.

4,043,378

METHOD FOR FORMING CASTING MOLDS

Reginald Alfred Pennington, Norton Shores, Mich., assignor to Westran Corporation, Muskegon, Mich.

Filed May 10, 1976, Ser. No. 684,874

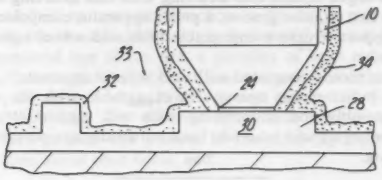
Int. Cl.[2] B22C *1/22, 9/08*

U.S. Cl. 164—17 **6 Claims**

1. A method of forming a shell mold comprising the steps of: forming a tubular frusto-conical shrink bob of a first thermo-

setting material such that said shrink bob is open at its base and apex.

positioning the apex of said shrink bob onto a shell mold casting pattern, and



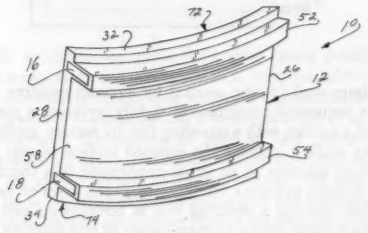
casting said shell mold casting pattern with a second thermosetting material whereby said second thermosetting material encases at least a portion of said shrink bob and forms the shell mold with the shrink bob joined thereto.

4,043,379

METHOD OF MAKING A MOLD

William S. Blazek, Valley City, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Apr. 12, 1976, Ser. No. 676,227
Int. Cl.[2] B22C *9/04, 7/02*
U.S. Cl. 164—23 **14 Claims**



1. A method of making at least a portion of a ceramic mold having a cavity for accurately forming a cast product and gating through which material can flow toward the cavity during the casting of the product, said method comprising the steps of forming a pattern assembly which at least partially defines a surface of the mold cavity in which the cast product is to be formed, said step of forming the pattern assembly including the steps of providing relatively flexible and destructable pattern material and a pair of relatively rigid members for reinforcing at least a portion of the pattern material which at least partially defines the surface of the mold cavity, said step of providing pattern material including the step of providing a body of pattern material having a pair of spaced apart and relatively thick main sections which at least partially correspond to a pair of spaced apart and relatively wide sections of the mold cavity in which the cast product is formed, said main sections of pattern material being interconnected by a relatively thin web section which at least partially corresponds to a relatively narrow section of the mold cavity in which the cast product is formed, said step of providing a pair of reinforcing members including the steps of providing a first reinforcing member connected with a first one of the main sections of pattern material and providing a second reinforcing member connected with a second one of the main sections of pattern material, repetitively dipping the pattern assembly in liquid ceramic mold material to form a covering of ceramic mold material overlying at least a portion of the pattern assembly, retarding deflection of the relatively flexible pattern material with the rigid reinforcing member during said dipping steps, destroying the pattern material to expose a ceramic mold material surface which defines at least a portion of the surface of the mold cavity in which the cast product is formed, and removing the reinforcing members from the ceramic mold material.

4,043,380

PRODUCTION OF PLASTER MOLDS BY MICROWAVE TREATMENT

James M. Valentine, Vandalia, Ohio, assignor to Valentine Match Plate Company, Vandalia, Ohio

Continuation-in-part of Ser. No. 419,580, Nov. 28, 1973, abandoned, which is a continuation-in-part of Ser. No. 253,204, May 15, 1972, abandoned. This application Sept. 2, 1975, Ser. No. 609,617
Int. Cl.[2] B22C *9/12*
U.S. Cl. 164—41 **7 Claims**

1. The method of fabricating, from gypsum-containing plaster, a foundry casting component which is to be used in casting a metal part from molten casting metal at a temperature above the boiling point of water, and from which the water must be substantially completely eliminated to prevent its turning to steam upon contact with the molten metal, which method comprises the steps of,

a. forming a moldable suspension of the plaster and water,

b. molding a mass of said suspension into a predetermined configuration,

c. subjecting said molded mass to electromagnetic wave energy at microwave frequency until the internal temperature of said mass exceeds the calcining temperature of gypsum while exposing substantially all surface areas of said mass for free evaporation of water and passage of steam therefrom,

d. discontinuing said exposing step and cooling said mass until the internal temperature thereof is substantially less than said calcining temperature, and

e. again subjecting said mass to microwave energy until the internal temperature thereof exceeds said calcining temperature while exposing substantially all surface areas thereof for free evaporation of water and passage of steam therefrom.

4,043,381

SELF-DESTRUCTIVE CORE MOLD MATERIALS FOR METAL ALLOYS

Khodabakhsh S. Mazdiyasni, Xenia, and Roger R. Wills, Columbus, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 9, 1976, Ser. No. 713,090
Int. Cl.[2] B22D *23/00*; B22C *1/00*; B22D *29/00*
U.S. Cl. 164—65 **5 Claims**

1. A method for casting metal alloys to form a hollow article which comprises introducing molten metal alloy into a mold containing a core body fabricated from a silicon yttrium oxynitride or a silicon lanthanideoxynitride, the mold being under a vacuum or in an inert atmosphere.

4,043,382

METHOD AND APPARATUS FOR CONTINUOUSLY CASTING STEEL

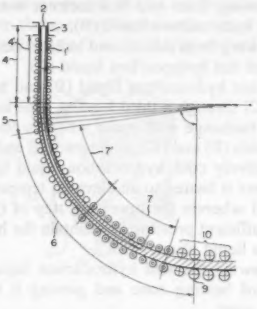
Katashi Saito; Toshio Matsumoto; Nobuhisa Hasebe, and Tatsuo Kobatake, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1975, Ser. No. 639,064
Claims priority, application Japan, Jan. 13, 1975, 50-5549
Int. Cl.[2] B22D *11/12*
U.S. Cl. 164—76 **6 Claims**

1. In a method for continuously casting steel which comprises continuously teeming molten steel into a straight mold; guiding an unsolidified cast strand with a solidified shell formed on it substantially vertically downward along a vertical guide section; then, guiding said unsolidified cast strand in the vertical position along a curved multiple-point bending guide

section comprising plural pairs of bending rollers while bending said unsolidified cast strand at multiple points by successively decreasing the radius of curvature of said unsolidified cast strand for each pair of said bending rollers; then, further guiding said unsolidified cast strand thus bent at multiple points along a constant curvature guide section comprising plural pairs of guide rollers, the radius of curvature of said constant curvature guide section being the same as that of the tail end of said multiple-point bending guide section; then, reducing the cast strand, near the solidification completing point thereof by at least a pair of reduction rolls at a draft of 0.1 to 2.0% per pair of reduction rolls; and then, straightening said cast strand thus reduced in a substantially horizontal direction at a single point at a spot-straightening point;

the improvement comprising:



setting the track length of said vertical guide within a range of from 3 to 7 m from the meniscus of molten steel in said straight mold;

setting the track length of said multiple-point bending guide within a range of from 1 to 4 m;

locating said at least one pair of reduction rolls to form the tail end of said constant curvature guide section, and the track length of said constant curvature guide being within a range of from 35 to 85% of the length from the meniscus of molten steel in said straight mold up to said spot-straightening point provided in succession to said constant curvature guide section; and

completing the solidification of said unsolidified cast strand within said constant curvature guide section.

4,043,383

CONTINUOUS CASTING STARTING BAR AND STOWAGE THEREOF

Don Eugene Isenberg, Pittsburgh; Irvin Lee Parker, Jr., Coraopolis, and Paul Allen Zelenski, Pittsburgh, all of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Sept. 23, 1976, Ser. No. 725,729
Int. Cl.[2] B22D *11/08*
U.S. Cl. 164—274 **10 Claims**

1. A continuous metal casting machine of the type including a mold from which a cast strand is withdrawn through powered pinch rolls and a strand straightener and disconnect apparatus, wherein the improvement comprises:

a. an arcuate starting bar adapted for sealing said mold and for connection to said cast strand;

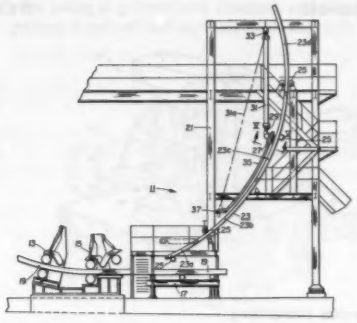
b. means supporting said starting bar in a position adjacent said machine from which position said bar can move into operative association with said machine;

c. guide means disposed parallely to said arcuate starting bar in said position; and

d. bar actuating means cooperating with said guide means and carring means for moving said bar into and out of, and for holding said bar in, said position.

8. A continuous metal casting machine of the type comprising a mold from which a cast strand is withdrawn through powered pinch rolls and a strand straightener and disconnect apparatus, wherein the improvement comprises:

a. an arcuate starting bar comprising arcuate segments joined rigidly together by tongue and clevis with pin connection therethrough; and



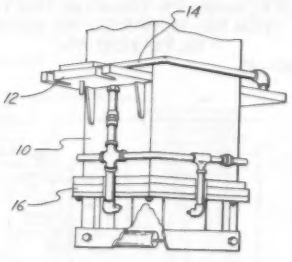
b. an arcuate end piece connected to one end of said bar so as to be pivotable only in the direction toward the center of curvature of said arcuate bar, and adapted for sealing mold and coacting with said cast strand.

4,043,384

SPRAY APPARATUS FOR CONTINUOUS CASTING MACHINE

John H.K. Piepenhagen, and Michael J. Vanecek, both of Beaumont, Tex., assignors to Georgetown Texas Steel Corporation, Beaumont, Tex.

Filed Oct. 13, 1976, Ser. No. 731,615
Int. Cl.[2] B22D *11/12*
U.S. Cl. 164—282 **4 Claims**



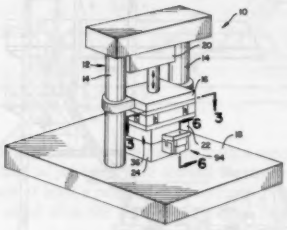
1. In a continuous casting machine which includes a tubular mold, a support for said mold and roller means beneath said mold for withdrawing a casting therefrom, the combination therewith of an improved mechanism for delivering spray water to all faces of a casting as it emerges from the bottom of said mold, said mechanism comprising: a water source communicating with said mold support, a first water distribution pipe depending from said mold support, a second water distribution pipe connected to said first pipe and extending generally in a horizontal plane and reaching each face of said mold, a multiplicity of downwardly extending water pipes communicating with said second distribution pipe, each downwardly extending pipe terminating beneath said mold and carrying a nozzle at its lower extremity, said nozzles being directed inwardly toward said mold whereby spray water delivered through said nozzles will contact the entire perimeter of a casting during withdrawal from said mold, and the entire spray mechanism with the exception of the nozzles is insulated from the casting by the vertical walls of the mold.

4,043,385

MOLDING APPARATUS

John R. Petrenchik, Pepper Pike, Ohio, assignor to Mercury Machine Co., Warrensville Heights, Ohio

Filed Aug. 23, 1976, Ser. No. 716,672
Int. Cl.[2] B22D *17/26*
U.S. Cl. 164—342 9 Claims



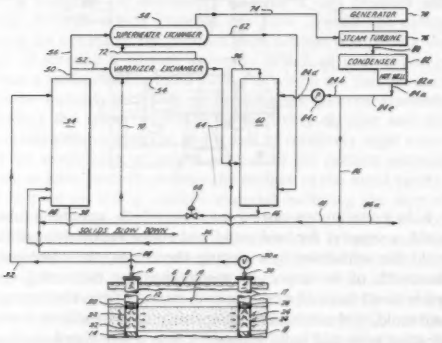
1. Apparatus comprising:
a pair of mold-defining members cooperating to form a mold chamber;
a pair of platens for selectively moving said mold-defining members toward and away from one another along a path;
mounting means for connecting said mold-defining members to said platens, said mounting means including means for permitting at least one of said mold-defining members to move freely in directions transverse to said path and rotate about an axis parallel to said path; and,
control means for causing said at least one mold-defining member to undergo a predetermined pattern of rotary and transverse movement during movement along said path.

4,043,386

ENERGY RECOVERY FROM GEOTHERMAL RESERVOIRS

William F. Franz, Gardiner, and Howard V. Hess, Glenham, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed May 30, 1975, Ser. No. 582,330
Int. Cl.[2] F03G *7/00*
U.S. Cl. 165—45 8 Claims



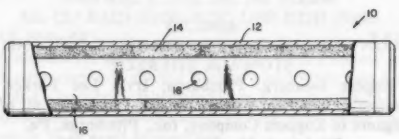
1. The process for recovering heat from a hot geothermal brine which comprises:
a. passing the hot brine in direct countercurrent contact with a relatively cool hydrocarbon liquid (A) in a first heating zone whereby the said brine is cooled and the said hydrocarbon liquid is heated to an elevated temperature under sufficient pressure to maintain the said brine and said hydrocarbon in liquid phase,
b. withdrawing the said heated hydrocarbon liquid from said first heating zone and passing it through a second heating zone comprising a first and a second indirect heat exchanger, wherein the said heated hydrocarbon withdrawn from the first heating zone is split into two hot hydrocarbon streams of unequal portions, wherein the larger portion hot hydrocarbon stream is passed through the said first indirect heat exchanger in indirect heat exchange with steam whereby the steam is heated to form saturated steam and the said layer portion hot hydrocarbon stream is cooled to form a second hot hydrocarbon liquid (B), and wherein the smaller portion hot hydrocarbon stream is passed through the said second indirect heat exchanger whereby the said saturated steam is heated to form superheated steam and the said smaller portion hot hydrocarbon stream is cooled to form a third hot hydrocarbon stream (C),
c. withdrawing the said superheated steam from the said second indirect heat exchanger of the second heating zone,
d. withdrawing from said first indirect heat exchanger the said hot hydrocarbon liquid (B),
e. withdrawing from said second indirect heat exchanger the said third hot hydrocarbon liquid (C),
f. passing hot hydrocarbon liquid (B) and hot hydrocarbon liquid (C) through a third heating zone in direct countercurrent exchange with water whereby the said hydrocarbon liquids (B) and (C) are intermixed and cooled to form the relatively cool hydrocarbon liquid (A), wherein the said water is heated to an elevated temperature and pressure and wherein the operating step of (f) is carried out under sufficient pressure to maintain the hydrocarbon and water in liquid phase,
g. withdrawing the said hydrocarbon liquid (A) from the said third heating zone and passing it to the said first heating zone,
h. withdrawing the said water heated to an elevated temperature and pressure from the said third heating zone and expanding it through a suitable valve whereby steam is formed and passing the said steam to the said second heating zone.

4,043,387

WATER HEAT PIPE WITH IMPROVED COMPATABILITY

Thomas R. Lamp, Torrance, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 26, 1976, Ser. No. 745,278
Int. Cl.[2] F28D *15/00*
U.S. Cl. 165—105 6 Claims



1. In a heat pipe including an enclosure and water as a working fluid in which the enclosure is formed of a material which combines with the water to generate hydrogen gas, the improvement comprising a getter selected from material having an affinity for hydrogen gas.

4,043,388

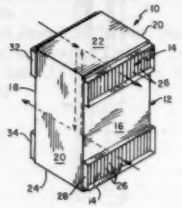
THERMAL TRANSFER CARE

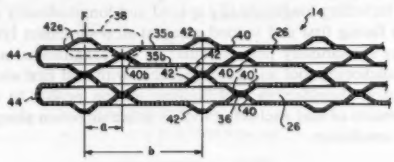
William Henry Zebuhr, Nashua, N.H., assignor to Deschamps Laboratories, Inc., East Hanover, N.J.

Filed Aug. 18, 1975, Ser. No. 605,654
Claims priority, application Canada, Aug. 14, 1975, 224,549
Int. Cl.[2] F28F *3/02*
U.S. Cl. 165—166 7 Claims

1. A heat exchanger for transmitting thermal energy from one moving body of fluid to another comprising a casing of

substantially constant cross-sectional area and a thermal transfer core within said casing, said core including a single, integrally formed, substantially continuous sheet of heat conductive material having a plurality of fold sections, separated by fold lines, the individual fold sections of said sheet dividing the interior of said casing into adjacent fluid flow passages, alternate ones of said passage defining first conduit means for conducting relatively warm fluids, the other passages defining second conduit means for conducting relatively cool fluids, said casing having first and second pairs of inlet and outlet openings formed therein, said first and second pairs of openings communicating with said first and second conduit means respectively, the individual fold sections of said sheet having a multiplicity of pairs of dimples formed therein, said dimple pairs being aligned longitudinally with respect to each other in at least two longitudinally extending zones, each said pair of dimples comprising a raised dimple and an adjacent depressed dimple wherein the spacing between the raised and depressed dimple in each dimple pair is small with respect to the spacing





between adjacent, longitudinally aligned pairs of dimples, the height of each dimple being substantially equal to one-half the width of said fluid flow passages, the individual fold sections of said sheet each having longitudinally extending ridges formed therein, each ridge being formed between zones of aligned dimple pairs of extending over the substantial length of said fold section and each ridge terminating before the next adjacent fold section, the terminal ends of said ridges in each fold section defining a fold line between the adjacent fold sections, said dimple pairs being located in said fold sections so that upon folding said sheet of heat conductive material upon said fold lines in opposite directions alternately, raised and depressed dimples in each dimple pair are in opposed, abutting relationship with corresponding raised and depressed dimples in adjacent fold sections, whereby said opposed, abutting dimples provide spacing between and mutual support for adjacent fold sections, said spacing between adjacnt fold sections defining said fluid flow passages in a manner such that the fluid pressure drop through the heat exchanger is reduced.

4,043,389

RAM-SHEAR AND SLIP DEVICE FOR WELL PIPE

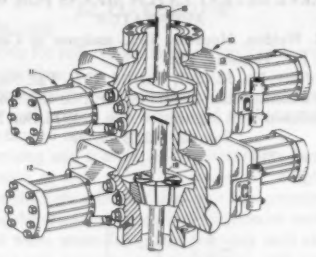
A. Tom Cobb, Seabrook, Tex., assignor to Continental Oil Company, Ponca City, Okla.

Filed Mar. 29, 1976, Ser. No. 671,464
Int. Cl.[2] E21B *29/00*
U.S. Cl. 166—55 **1 Claim**

1. Blowout prevention apparatus comprising:

a ram-shear forming a part of said apparatus and adapted to sever a pipe string extending therethrough into a wellbore; and

a slip device forming a part of said apparatus, said slip device being positioned below said ram-shear and being movable from a first position in which said pipe string is freely movable therethrough to a second position in which said pipe string is gripped and retained, said slip device comprising a pair of half-sections each movable toward and



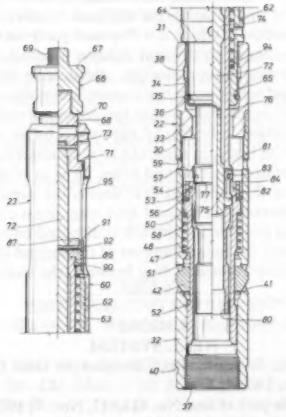
away from a pipe string extending therethrough and each of said half-sections comprising a bowl member and a plurality of gripping segments attached to said bowl member whereby upon movement of said half-sections toward a pipe string extending therethrough said gripping segments contact said pipe string and prevent downward travel thereof, said gripping segments being attached by strap connectors extending from the top of said bowl member to the top of a gripping segment.

4,043,390

ANCHORING DEVICE AND RUNNING TOOL FOR DOWNHOLE APPARATUS

Bernard Jean-Pierre Glotin, Saint Maur, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Nov. 10, 1976, Ser. No. 740,648
Claims priority, application France, Nov. 19, 1975, 75.35272
Int. Cl.[2] E21B *23/00*
U.S. Cl. 166—215 **15 Claims**



1. Apparatus for use in anchoring a device in a well conduit, comprising: a tubular body member; anchoring means mounted on said body member for movement between retracted and extended positions; expander means movable longitudinally within said body member between first and second longitudinally spaced positions for respectively enabling retraction and causing extension of said anchoring means; detent

means releasably connected to said expander means and operative upon movement of said expander means to said second position for locking said expander means to said body member; and means for disconnecting said detent means from said expander means to enable return of said expander means to said first position.

4,043,391

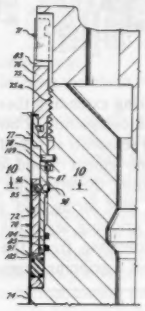
SLEEVE DETENT LATCH MEANS FOR WELL APPARATUS

James M. Weldon, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Division of Ser. No. 523,367, Nov. 13, 1974, Pat. No. 4,008,898, which is a continuation-in-part of Ser. No. 480,754, June 19, 1974, abandoned. This application Aug. 2, 1976, Ser. No. 710,653

Int. Cl.² E21B *23/00*

U.S. Cl. 166—217 **4 Claims**



1. Well apparatus, comprising a body lowerable into the bore of a well member, a first sleeve vertically slidable about the body, a second sleeve vertically slidable about the first sleeve, said body having a groove thereabout, said first and second sleeves having oppositely facing grooves about their outer and inner diameters, respectively, and said first sleeve having a plurality of holes therethrough connecting the groove thereabout with the inner diameter of said sleeve opposite the groove about the body, a detent radially slidable within each hole, and a split ring which is normally circumferentially contracted to a position in which it is disposed partly in the groove of each sleeve, so as to prevent relative vertical sliding between the first and second sleeves, said detents being forced inwardly by said split ring, when circumferentially contracted, to dispose their inner ends within the groove about the body, and thus in position to be forced outwardly by an edge of the groove about the body, in response to such relative sliding, to dispose them entirely within said holes, so as to permit relative sliding between the body and first sleeve, the outward movement of said detents forcing said split ring into a circumferentially expanded position in which it is disposed entirely within the groove about the inner diameter of the second sleeve, so as to permit relative vertical sliding between the sleeves.

4,043,392

WELL SYSTEM

Imre I. Gazda, Saginaw, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 413,617, Nov. 7, 1973, Pat. No. 3,874,634, and Ser. No. 542,117, Jan. 20, 1975. This application Oct. 31, 1975, Ser. No. 627,683

Int. Cl.² E21B *23/00*

U.S. Cl. 166—217 **11 Claims**

1. Locating and locking apparatus for selectively positioning and securing a well tool at a desired location along a flow conductor of a well bore comprising: means providing a landing section in said flow conductor having an internal locating and locking profile including a first internal stop shoulder facing a first longitudinal direction along said landing section and a second internal stop shoulder spaced from said first stop shoulder and facing in a second opposite longitudinal direction along said landing section; said first and second stop shoulders lying in planes substantially perpendicular to the longitudinal axis of said landing section along said flow conductor; and means providing an anchoring tool including at least one locating and locking key having an external locating and locking profile engageable in said internal profile of said landing section, including longitudinally spaced and longitudinally oppositely facing first and second external stop shoulders lying in planes substantially perpendicular to the longitudinal axis of said anchoring tool and co-engageable with said first and second stop shoulders in said landing section profile to arrest movement of said anchoring tool in either direction along said flow conductor.

4,043,393

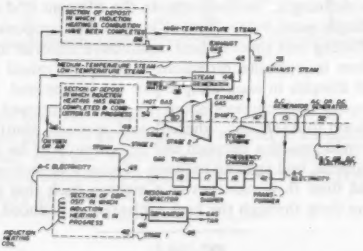
EXTRACTION FROM UNDERGROUND COAL DEPOSITS

Sidney T. Fisher, 53 Morrison Ave., and Charles B. Fisher, 2850 Hill Park Road, both of Montreal, Quebec, Canada

Filed July 29, 1976, Ser. No. 709,832

Int. Cl.² E21B *43/24, 43/25*

U.S. Cl. 166—248 **12 Claims**



1. A method of processing of an underground coal deposit in situ for the extraction of matter or energy therefrom comprising:

a. substantially encompassing a selected portion of said underground coal deposit with electrical conductor segments;

b. heating by electrical induction said selected portion of the

deposit to a temperature sufficient to generate economically recoverable matter or energy; and

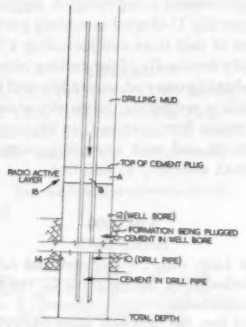
c. conveying said matter or energy to the surface of the ground.

4,043,394

PLUGGING OF ABANDONED DRY WELLS

Douglas C. Campbell, 30 Sandpiper Drive, Sherwood Park, Alberta, Canada

Filed June 2, 1976, Ser. No. 692,189
Claims priority, application Canada, June 9, 1975, 228868
Int. Cl.[2] E21B *33/13, 47/04*
U.S. Cl. 166—253 4 Claims



1. In a method of plugging a potential producing zone or formation of known extent and elevation in a well bore with cement, including the steps of positioning a hollow pipe or stem at a selected location relative to the lower level of the formation and injecting cement through said pipe in an amount estimated to be sufficient to extend at least the full length of said formation to prevent seepage from the formation after the pipe has been withdrawn and the cement has hardened, the improvememt wherein a selected portion of the cement which is injected contains a radioactive tracer therein with said selected portion being injected such as to provide a layer of cement having said tracer therein at the top of the wet cement plug, and wherein said cement which contains the radioactive tracer therein is injected in two parts, one part being injected first, with the untreated cement being injected thereafter and displacing the treated cement upwardly thereby to form a ring of treated cement around said pipe, and the other part of the treated cement being injected last so that it is located within said pipe at about the same level as said one part, the pipe being thereafter withdrawn from the cement thus allowing the two parts of treated cement to flow together to form said layer with one of said parts flowing over the other part if there is a difference in the levels of said two parts of treated cement at the end of the injection step, and, after the pipe has been withdrawn from the wet cement, lowering into the well bore a detecting means sensitive to and emitting an output in response to the presence of the tracer material, and determining the elevation of the top of the wet cement plug by analyzing the output of the detecting means.

4,043,395

METHOD FOR REMOVING METHANE FROM COAL

Richard L. Every, Warrington, Pa., and Luino Dell'Ossc, Jr., Washington, D.C., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 558,089, March 13, 1975, abandoned, which is a continuation-in-part of Ser. No. 252,072, May 10, 1972, abandoned. This application June 7, 1976, Ser. No. 693,561
Int. Cl.[2] E21B *43/00*
U.S. Cl. 166—263 5 Claims

1. A process for removing methane from a subterranean coal deposit comprising:

a. providing at least one injection well and at least one recovery well spaced therefrom, said wells extending from the surface to said coal deposit;

b. pressurizing said coal deposit by injecting a gaseous fluid containing at least about 20 percent by weight carbon dioxide through said injection well at a pressure not exceeding the cracking pressure of said deposit into said coal deposit while maintaining said recovery well closed;

c. stopping said injection and maintaining said deposit in a pressurized condition for a period of time sufficient to enable a substantial amount of methane which is adsorbed on said coal deposit to be desorbed therefrom;

d. opening said recovery well after step (c) to recover injected fluid and desorbed methane from said coal deposit;

e. closing said recovery well after step (d); and

f. repeating steps (b) through (e) until enough methane has been removed from said coal deposit to enable the deposit to be worked safely.

4,043,396

ALKOXYLATED ASPHALT AS SACRIFICIAL AGENTS IN OIL RECOVERY PROCESSES

Mohan Vaikunth Kudchadker, and Thad Oscar Walker, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 612,118, Sept. 10, 1975, Pat. No. 3,978,927. This application June 16, 1976, Ser. No. 696,673
The portion of the term of this patent subsequent to Sept. 7, 1993, has been disclaimed.
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—274 9 Claims

6. In a method for recovering oil from a subterranean formation containing oil and having an injection well and a production well wherein a surfactant solution is injected into the injection well in order to drive the oil to the production well where it is produced the improvement which comprises:

injecting into the injection well prior to the surfactant an aqueous solution of alkoxylated asphalts.

4,043,397

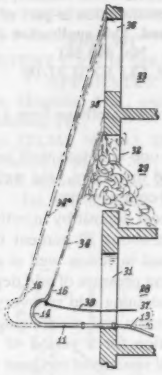
FIRE FIGHTING EQUIPMENT

Richard A. Glowienke, Rte. No. 1, Box 720, Necedah, Wis. 54646

Filed Sept. 22, 1975, Ser. No. 615,523
Int. Cl.[2] A62C *1/00, 31/00;* B05B *1/14*
U.S. Cl. 169—45 4 Claims

1. The method of preventing looping of billowing flames on a floor level of a building structure, locating a fluid flow pipe having a reverse bend of 180° at its discharge end on a floor level below said first mentioned floor level, connecting the other end of said pipe to a source of pressurized water, connecting a spray nozzle to the bent end of said pipe and at an angle thereto, extending the pipe through a wall opening to locate the nozzle outside the building structure, and discharg-

ing a substantially solid wall of water in the form of a spray from said nozzle without back pressure onto the building structure above the first mentioned floor level so as to overlie and contain the billowing flames and prevent their looping.



4,043,398

MOBILE BALLAST CLEANING MACHINE

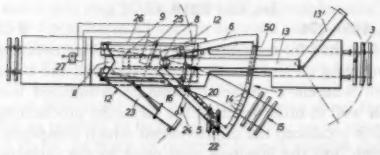
Karl Fölser, Linz-Urfahr, and Josef Theurer, Vienna, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H., Vienna, Austria

Continuation-in-part of Ser. No. 597,414, July 21, 1975. This application Dec. 18, 1975, Ser. No. 641,749

Claims priority, application Austria, Jan. 10, 1975, 135/75; Aug. 14, 1974, 6688/74

Int. Cl.[2] F01B *27/00*

U.S. Cl. 171—16 **13 Claims**



1. In a mobile track maintenance machine useful for work in track switches and crossings, which comprises an endless ballast excavation chain including a chain section mounted for extension transversely of, and below, the track for excavating ballast supporting the track on a subgrade, means mounted on the machine adjacent the excavation chain and remote from the chain section for separating the excavated ballast from fines to produce cleaned ballast, and means mounted on the machine and arranged to receive the cleaned ballast from the separating means for distributing the cleaned ballast and the fines, the improvement of

1. a transversely extending guide for the chain section mounted on the machine and adjustable to selected lengths for a corresponding change in the width of the ballast excavation effectuated by the chain section,
2. the distributing means being adjustable over the entire width of ballast excavation for selectively distributing the cleaned ballast within this width, and
3. mobile support means mounted to support the excavation chain during movement of the machine.

4,043,399

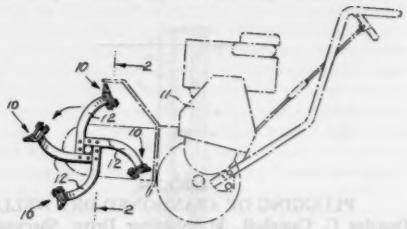
TOOTH FOR A ROTO TILLER

Burk Guy Morrison, 160A - W. 5th Ave., Sparks, Nev. 89431

Filed Aug. 11, 1976, Ser. No. 713,626

Int. Cl.[2] A01B *33/02*

U.S. Cl. 172—42 **4 Claims**



1. In combination with a roto tiller having a plurality of radially extending tines mounted to rotate about a generally horizontal axis and wherein each tine terminates in a generally axially extending earth working blade having a cutting edge thereon, the improvement comprising: A digging tooth assembly having a generally U-shaped mounting portion telescoped over at least one of said tines and including a leading portion positioned slightly forwardly of the cutting edge on said blade, a digging tooth having one end secured to said leading portion and having a surface projecting outwardly at an angle inclined forwardly to a radius from said axis, an angle support member between said tooth and said mounting portion, and means securing said tooth assembly to said tine.

4,043,400

HARROWS

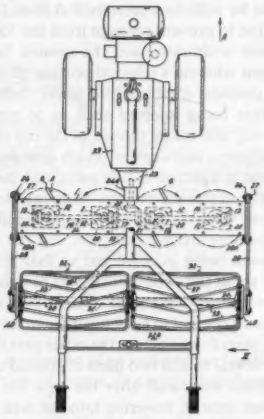
Cornelis van der Lely, Zug, Switzerland, and Ary van der Lely, Maasland, Netherlands, assignors to C. van der Lely N. V., Maasland, Netherlands

Continuation of Ser. No. 369,918, June 14, 1973, abandoned. This application Oct. 13, 1976, Ser. No. 732,093

Claims priority, application Netherlands, June 23, 1972, 7208617

Int. Cl.[2] A01B *33/06, 49/02, 33/08*

U.S. Cl. 172—43 **9 Claims**



1. A rotary harrow comprising a frame portion supporting at least four soil-working members rotatably mounted side-by-side in a row that extends transverse to the normal direction of

travel on corresponding upwardly extending shafts, driving means supported by said frame portion and said driving means engaging said shafts to rotate same about axes defined by said shafts, a rotatable transversely extending supporting member being connected to said frame portion to the rear of said soil-working members, said supporting member comprising at least two portions and each of said portions having a periphery comprising ground engaging rods mounted on at least one elongated support, said rotatable portions being located adjacent one another and being rotatable about a common horizontal transverse axis, said rods extending in the same general direction as said common axis and having angular bends between their opposite ends, the points of said bends being located substantially in line with a plane that extends midway between two adjacent soil-working members and parallel to the direction of travel of the harrow.

4,043,401

SOIL CULTIVATING IMPLEMENTS

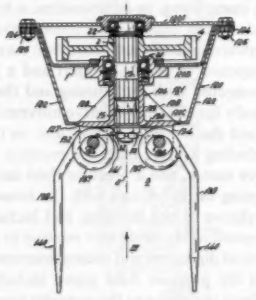
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed July 17, 1975, Ser. No. 596,826

Claims priority, application Netherlands, July 18, 1974, 7409705

Int. Cl.[2] A01B *33/06, 71/08*

U.S. Cl. 172—59 **14 Claims**



1. A soil-cultivating implement comprising a frame and at least one soil-working member supported on a hollow portion of said frame, said portion comprising three vertically spaced apart plates that define upper and lower chambers between a top and a central plate and between said central plate and a bottom plate, respectively, said soil-working member being rotatable about an upwardly extending shaft and driving means connected to said shaft to rotate same, said shaft being journalled within said portion and tool support means being connected to the shaft's lower portion, said support means including a hub that is substantially positioned entirely within the lower chamber, downwardly extending tool means connected to said support means and the lower side of said support means being flanged and fitted with minimal clearance in a hole in said bottom plate to exclude soil, said lower side being positioned at substantially the same level as the bottom plate and having connecting means fastened to at least one downwardly extending tine.

4,043,402

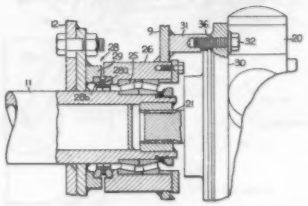
SOIL STABILIZER MACHINE WITH DETACHABLE HYDRAULIC MOTOR STRUCTURE DRIVING ROTATABLY MOUNTED CUTTING ELEMENTS

Albert W. Nelson, Springfield, Ohio, assignor to Koehring Company, Milwaukee, Wis.

Continuation of Ser. No. 561,225, March 24, 1975, abandoned, which is a division of Ser. No. 483,885, June 27, 1974, Pat. No. 3,907,038, which is a division of Ser. No. 398,315, Sept. 18, 1973, Pat. No. 3,865,195, which is a division of Ser. No. 269,228, July 5, 1972, Pat. No. 3,795,279. This application Mar. 3, 1976, Ser. No. 663,535

Int. Cl.[2] A01B *33/02*

U.S. Cl. 172—112 **8 Claims**



1. A soil working machine: a chassis, traction wheels for said chassis, an engine on said chassis, a hydraulic pump on said chassis driven by said engine, and a soil stabilizer unit connected to said chassis, said unit comprising: a supporting frame connected to said chassis and vertically movable with respect to said chassis, said supporting frame comprising a horizontally disposed cross tube and a pair of spaced apart rearwardly extending lifting arms rigidly connected to said cross tube, means for moving said supporting frame to fixed positions with respect to said chassis, a mixing chamber hood mounted on said supporting frame, a horizontally disposed rotor with cutting elements thereon rotatably mounted on said supported frame and located within said hood, said rotor being rotatably mounted between said lift arms, bearing means on said lift arms for rotatably supporting said rotor, at least one detachable hydraulic motor located exteriorly of said hood for driving said rotor, said hydraulic motor comprising a motor housing and a rotatable drive shaft, means for releasably connecting said motor housing to said supporting frame, means for releasably connecting said drive shaft to one end of said rotor, said releasable connecting means comprising said rotor and said drive shaft being formed such that an axial opening in one of said rotor and said drive shaft matingly and frictionally receives an axial projection extending from the other of said rotor and said drive shaft and means for supplying said motor with operating fluid from said pump to drive said motor and said rotor connected thereto.

4,043,403

AGRICULTURAL IMPLEMENT FRAME ELEVATING MECHANISM

Carl M. Anderson, and Charles W. Anderson, both of Kewanee, Ill., assignors to Chromalloy American Corporation, St. Louis, Mo.

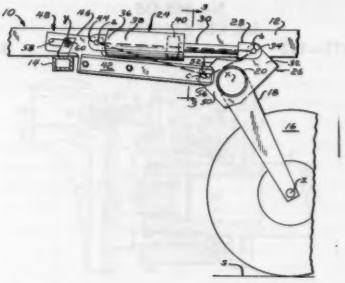
Filed Mar. 23, 1976, Ser. No. 669,485

Int. Cl.[2] A01B *65/06*

U.S. Cl. 172—413 **11 Claims**

1. In an agricultural implement having a frame, a wheel-supporting arm journalled on the frame for rotation on an axis extending transversely of said frame, and torque means actuatable to swing the wheel supporting arm on said axis and thereby to effectively raise or lower a wheel supported on said arm relative to the implement frame, said torque means comprising a pair of angularly displaced radial arms rigidly fixed to the wheel supporting arm to turn therewith on said axis, a cradle embodying a rigid member having one end pivotally connected to one of said radial arms at a location herein desig-

nated *c*, and mounting means pivotally connecting the other end of the cradle rigid member to the implement frame remote from said axis, and a length-adjustable member having one end pivotally connected to the other of said radial arms at a location herein designated *b* and its opposite end pivotally connected to the cradle rigid member at a location herein designated *a* which is spaced from said axis, the spacing of *a* from *c* and *c* from *b* remaining constant as the spacing of *a* from *b* changes in response to extension and retraction of said lengthadjustable member so as to apply torque to the wheel supporting arm through the other of said radial arms, and said mounting means accommodating movement of the cradle rigid member generally lengthwise of the implement frame in response to extension and retraction of the lengthadjustable member, said mounting means limiting displacement of the pivotal connection of the cradle rigid member to the implement frame in directions transversely of said generally lengthwise movement of the cradle rigid member.

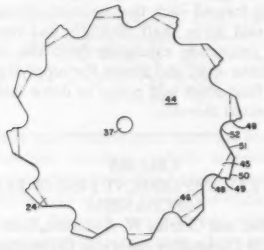


4,043,404

TILLAGE APPARATUS HAVING IMPROVED CUTTING AND DRIVE STRUCTURE

Donald Thomas Sorlie, Ankeny; David Hoffer Bucher, and Gail Russell Sutherland, both of Des Moines, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jan. 15, 1976, Ser. No. 649,279
Int. Cl.[2] A01B *21/02*
U.S. Cl. 172—555 **6 Claims**



1. In a tillage apparatus, a cutter wheel for cutting a trench in soil comprising:

a thin flat disc having a periphery and a body, the opposite faces of which define closely spaced parallel planes; and

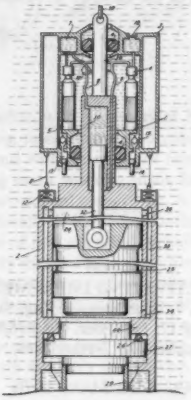
a plurality of teeth at the periphery of and integral with said disc and having alternate teeth offset in opposite axial directions with respect to the disc body, said teeth extending outwardly at the periphery of said disc and angularly spaced at least 15° apart, said teeth having radially extending leading cutting edges movable in a circular path, and inwardly extending rear edges, each of the latter being composed of a first portion that joins in a trailing relationship with and beginning at the respective cutting edge and is inclined inwardly for the entirety of its extent with respect to the aforesaid circular path, a second inclined portion that continues inwardly at a larger angle from said first portion, and an arcuate portion that joins said second portion and the cutting edge of an adjacent tooth.

4,043,405

PILE-DRIVING ARRANGEMENT

Hans Kühn, Hamburg, Germany, assignor to Koehring GmbH, Ellerau, Germany

Filed Nov. 17, 1975, Ser. No. 632,424
Claims priority, application Germany, Nov. 16, 1974, 2454488; Nov. 16, 1974, 2454521; Aug. 30, 1975, 2538642
Int. Cl.[2] B25D *9/00*; **E21B** *1/00*
U.S. Cl. 173—127 **51 Claims**



1. A pile-driving arrangement for driving piles both above and below water, comprising, in combination, a housing containing a gas-filled motion chamber; an impact body movable upward and downward in the motion chamber; a cylinder-and-piston mover comprised of a cylinder part and a piston part, one part being connected with the housing and the other part with the impact body for effecting relative movement between the impact body and the housing; a drive unit on the housing, the drive unit including a drive motor, a pressure fluid pump driven by the drive motor, and a pressure fluid tank; connecting means connecting the drive unit with the housing for limited movability relative to the housing, and including means for resisting movement of the drive unit relative to the housing in at least one vertical direction; and means interconnecting the cylinder part and the pressure fluid pump including flexible conduits leading from the pump to the opposite working chambers of the cylinder part and a direction-changing device for controlling fluid flow through the conduits.

4,043,406

CHANCE DEVICE FOR BOARD RACING GAME

Tobin Wolf, 285 Aycrigg Ave., Passaic, N.J. 07055

Filed July 11, 1975, Ser. No. 595,328
Int. Cl.[2] A63F *9/00*; **A63H** *13/20*
U.S. Cl. 273—138 R **16 Claims**

1. A device for providing simultaneous circular and random radial action in a single plane to a toy which comprises,

a. a platen,

b. a base,

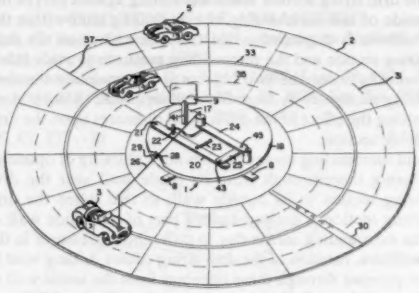
c. a toy,

d. a motor,

e. means secured to said base forming a first axis and first means rotatable about said first axis under power of said motor to rotate said platen about said first axis,

f. second means rotatable about a second axis different from said first axis,

g. third means coupled to said first and second means for rotating said second means, and



h. means including said platen responsive to rotation of said first and second means coupled to said toy to provide said circular and random radial movement in a single plane to said toy in said plane.

4,043,407

DRILLING SAMPLING/TESTING EQUIPMENT

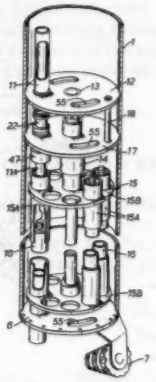
John William Wilkins, Hounslow, England, assignor to Taywood Seltrust Offshore, England

Filed Feb. 6, 1976, Ser. No. 655,982

Claims priority, application United Kingdom, Feb. 6, 1975, 5173/75

Int. Cl.[2] E21B *7/12;* E21C *1/00*

U.S. Cl. 175—50 8 Claims



1. Drilling, sampling and testing equipment comprising a drill; a plurality of sample receivers and a testing means mounted for entering with the drill a bore being drilled by the drill, the sample receivers being movable so as successively to be disposed at a sampling station and the testing means being movable to be disposed at a testing station adjacent said sampling station; first means for operating that sample receiver disposed at said sampling station to obtain a sample therein; second means for operating the testing means to effect testing; and third means, arranged to be actuated in dependence upon sample receiver operation effected by said first means to move the so-operated sample receiver with its obtained sample away from said sampling station and to move the next successive sample receiver to said sampling station whereby samples can be obtained by successive sample receivers at successive levels in a bore hole during drilling of the bore hole; said second means being operable such that sampling and testing can be carried out at the same time.

4,043,408

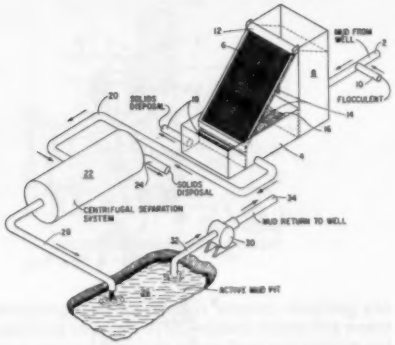
APPARATUS FOR REMOVING CONCRETE AROUND EXPOSED REINFORCING ROD

William Dale Griffin, 3601 Jefferson Ave., Texarkana, Arkansas 75501

Filed June 18, 1976, Ser. No. 697,694

Int. Cl.[2] E21C *13/06*

U.S. Cl. 175—416 2 Claims



1. Apparatus for removing concrete around the exposed portion of a reinforcing rod or the like, said apparatus comprising:

an elongated drill shaft having a central opening adapted to be slidably positioned over the exposed portion of the rod,

a cutting head having a plurality of substantially radially outwardly extending teeth secured to the leading end of said drill shaft and adapted to surround the inner end of the exposed portion of the rod to remove the concrete surrounding said rod when said drill shaft is moved on said rod in a predetermined manner, and

one of said teeth extending outwardly a greater distance than the other teeth to cut an enlarged section in the concrete when said drill shaft is moved in a predetermined manner for accommodating a means for cutting the exposed portion of the rod beneath the surface of the concrete.

4,043,409

DRILL STEEL FOR DEEP DRILL HAMMERS

Hans-Philipp Walter, Fabrikant, deutscher Staatsangehoriger, Neissestrasse 1 D-3570, Stadt Allendorf 1, Germany

Filed Mar. 22, 1976, Ser. No. 669,119

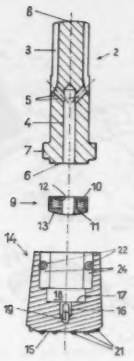
Claims priority, application Germany, Mar. 22, 1975, 2512784

Int. Cl.[2] E21B *17/00;* E21C *15/00*

U.S. Cl. 175—321 33 Claims

1. A steel drill device for down-hole drills, with a bore crown widened out in the direction of the working surface and fitted with flush bores, cavities and hard metal inserts, especially X cutting edges, ribs and buttons, and having a shaft with longitudinal grooves on the outside, the cross-section of which is smaller in comparison with the bore crown, the bore crown being in the form of a wear bit interchangeably connected to the shaft with flexible cushioning, wherein the latter is a resil-

ient pad located under stress between the end of said shaft and an inner face of said wear bit, and wherein said resilient pad



and said wear bit are penetrated at least partly by a central passage.

4,043,410

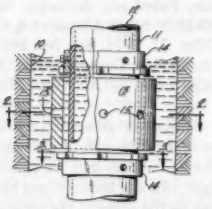
ANTI-STICKING TOOL FOR DRILL PIPE

John D. Bennett, Denton, and Thomas W. Gallier, Plano, both of Tex., assignors to Suntech, Inc., St. Davids, Pa.

Filed July 12, 1976, Ser. No. 704,711

Int. Cl.[2] E21B *17/10*

U.S. Cl. 175—323 **7 Claims**



1. An anti-sticking tool for use with a drill string in a wellbore subject to differential pressures from the pressurized drilling mud and the wellbore formation, great enough to cause a section or sections of a drill string to become stuck against the side of the wellbore, comprising:

a. means, rotatably mounted, for surrounding a predetermined portion of the drill string, so that upon rotation of the drill string section when it is resting against part of the inside of said surrounding means, drilling mud within the wellbore is displaced inside the space between the drill string section and the surrounding means to provide lubrication between the two objects and to maintain the drill string section away from the wellbore wall, thereby minimizing the effect of the differential pressures upon the drill string section;

b. said surrounding means also having a plurality of openings passing therethrough from its inside wall near the drill string section to its outside wall, so that when the drill string section is pressed against part of the inside wall of the surrounding means due to differential pressures in the wellbore, rotation of the drill string causes drilling mud to be pumped through these openings from the inside wall to the outside wall, thereby reducing the effects of differential pressures; and

c. means for restricting the movement of the surrounding means along the longitudinal axis of the drill string.

4,043,411

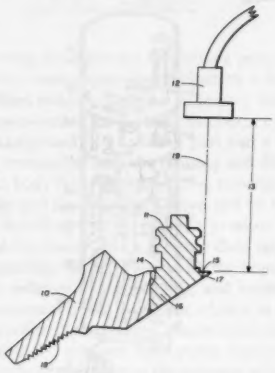
ROTARY ROCK BIT WITH THE BEARING PIN FUSED TO THE ROCK BIT ARM

Carl Laurent Lichte, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 12, 1976, Ser. No. 741,167

Int. Cl.[2] E21B *9/08*

U.S. Cl. 175—369 **13 Claims**



1. A method of constructing a rotary rock bit, comprising the steps of:

providing a rock bit arm, said rock bit arm having a side with a shirttail surface and a side with a cutter receiving surface;

providing a bearing pin, said bearing pin having a bearing section and a mounting section with at least a portion of said mounting section being larger in diameter than said bearing section;

providing a mounting passage in said rock bit arm, said mounting passage extending from said cutter receiving surface;

positioning said mounting section of said bearing pin in said mounting passage of said rock bit arm thereby forming a seam between said mounting section of said bearing pin and said mounting passage in said rock bit arm;

aligning a beam of energy with said seam and directing said beam of energy into said seam from the side of the rock bit arm having said cutter receiving surface;

causing relative movement between said beam of energy and said seam to fuse said bearing pin to said rock bit arm; and mounting a cutter upon said bearing pin.

4,043,412

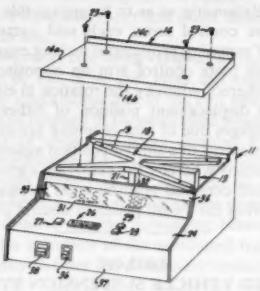
COUNTING SCALE AND METHOD

Frank C. Rock, Santa Rosa, Calif., assignor to National Controls, Inc., Santa Rosa, Calif.

Continuation-in-part of Ser. No. 510,467, Sept. 30, 1974, Pat. No. 3,951,221. This application Mar. 22, 1976, Ser. No. 668,855

Int. Cl.[2] G01G *19/04*

U.S. Cl. 177—25 15 Claims



15. In an electronic counting scale: a base, a load cell mounted on the base for providing electrical signals corresponding to the forces applied thereto, a platform mounted on and supported by the load cell for successively receiving a sample consisting of a predetermined number of articles and a load consisting of an unknown number of the articles, and signal processing means including a microprocessor responsive to the load cell signals produced by the sample and the load for delivering an output signal corresponding to the number of articles in the load.

4,043,413

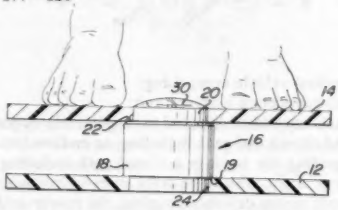
PORTABLE AND COLLAPSIBLE BATHROOM-TYPE SCALE

Susan M. Schaenen, 145 Central Park West, New York, N.Y. 10023

Filed May 7, 1976, Ser. No. 684,443

Int. Cl.[2] G01G *21/00, 21/22*

U.S. Cl. 177—126 9 Claims



1. A portable and collapsible scale, comprising a base plate adapted to rest on a support surface, a receptacle in said base plate, a weighing unit having a portion thereof complementally shaped with respect to said receptacle and adapted to be received therein when said scale is operatively disposed, and an upper plate removably engagable with said weighing unit and in spaced parallel relation to said base plate when said scale is operatively disposed, said weighing unit having weight readout means thereon readable from above said upper plate when said upper plate is operatively disposed.

4,043,414

WEIGHING SCALE WITH COMPENSATING WEIGHTS

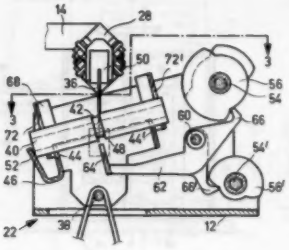
Andreas Stutz, Aathal, Switzerland, assignor to Mettler Instrumente AG, Greifensee-Zurich, Switzerland

Filed June 17, 1976, Ser. No. 697,026

Claims priority, application Switzerland, Aug. 15, 1975, 10649/75

Int. Cl.[2] G01G *21/26*

U.S. Cl. 177—248 12 Claims



1. In a weighing scale including a support; weighing pan means for receiving an object to be weighed; suspending means for suspending said weighing pan means from said support and for thereby transmitting gravitational force to said support; adjusting means for adjusting said force to a value similar to a predetermined value and including a carrier fastened to said weighing pan means, a plurality of compensating weights, and shifting means on the support for shifting each of said weights to and from a position of load transmitting engagement with said carrier; and indicating means for indicating a difference between said similar value and said predetermined value, the improvement in said adjusting means which comprises:

a. guide means on said carrier, each of said compensating weights being elongated, and said guide means defining respective paths of longitudinal sliding movement for said compensating weights, said paths being obliquely inclined relative to the horizontal when said pan means with the fastened carrier is suspended from said support by said suspending means; and

b. stop means on said carrier limiting said sliding movement of each compensating weight to a fixed, lowermost position of said load transmitting engagement.

4,043,415

PRECISION BALANCE WITH PAN ASSEMBLY GUIDED BY PARALLELOGRAM LINKAGE HAVING TWO FLEXIBLE MEMBERS

Paul Lüchinger, Greifensee, Switzerland, assignor to Mettler Instrumente AG, Greifensee-Zurich, Switzerland

Filed June 24, 1976, Ser. No. 699,492

Claims priority, application Switzerland, Oct. 10, 1975, 13207/75

Int. Cl.[2] G01G *21/24*

U.S. Cl. 177—255 10 Claims

1. A precision balance comprising:

a. a support assembly;

b. a weighing pan assembly;

c. guide means for guiding said weighing pan assembly relative to said support assembly in a path of movement having a predominant vertical component when said balance is in the operating position thereof, said guide means including

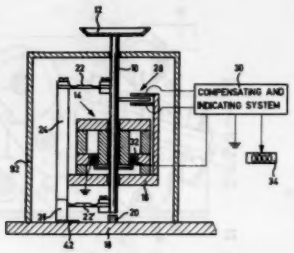
1. two elongated, transversely flexible link members transversely spaced in a vertical direction,

2. each link member having a first end portion secured to said support assembly and a second end portion secured to said weighing pan assembly; and

d. adjusting means for moving at least one of said link members toward and away from a position in which the respec-

tive directions of elongation of said link members are parallel, said adjusting means including

1. a first adjusting member and a second adjusting member, said adjusting members being mounted on said support assembly for movement by manual operation,
2. first and second motion transmitting means respectively interposed between said first and second adjusting members and said at least one end portion for moving the associated end portion in response to movement of the associated adjusting member,



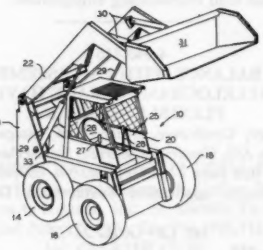
3. the movement of the end portion associated with said first motion transmitting means in response to a movement of predetermined magnitude of said first adjusting member being greater than the movement of the end portion associated with said second motion transmitting means in response to a movement of said second adjusting member of a magnitude identical with said predetermined magnitude.

4,043,416

SKID-STEERED TRACTOR VEHICLE COMBINED STEERING LEVER AND AUXILIARY CONTROL WITH SELF-CENTERING MECHANISM

Larry E. Albright, Gwinner; James J. Bauer, Lisbon, and Earl W. Cramton, Gwinner, all of N. Dak., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Nov. 26, 1975, Ser. No. 635,559
Int. Cl.[2] B62D *11/04*
U.S. Cl. 180—6.48 **6 Claims**



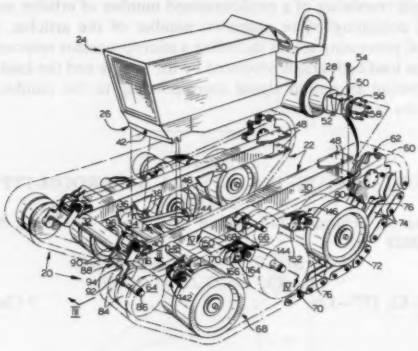
3. A skid-steered tractor vehicle propelled and steered by driving ground-engaging wheels on one side at different speeds or directions from ground-engaging wheels on the opposite side so as to effect skid turns having separate right and left hydrostatic drives propelling and maneuvering the vehicle in forward and reverse directions, each said hydrostatic drive comprising a variable displacement pump having a swash plate normally biased to a zero displacement position and which is variable from said zero displacement position to maximum displacement positions in either direction for producing forward and reverse drive, right and left steering levers, one on each side of the driver's compartment associated with the right and left hydrostatic drives, first and second rotatable shafts connected to the right and left steering levers and operatively connected to the swash plates of the variable displacement pumps of the right and left hydrostatic drives, the improvement comprising a drive shaft for driving the pumps in axially aligned relationship, a swash plate control arm associated with each pump swash plate, a shaft connecting each swash plate control arm and the associated swash plate projecting from each pump on one side of the common pump axis each being independently rotatable by the swash plate control arm for varying the displacement position of the swash plate, first and second links connected to the first and second rotatable shafts, a centering mechanism including an elongated centering element shiftable parallel to the common pump axis, yieldable means urging said element in one direction, and a pair of camming elements carried on said centering element in longitudinally spaced relationship so as to be engageable with each of the swash plate control arms, each said camming element having a pair of camming projections making engagement with each said swash plate control arm on opposite sides of the rotational axis thereof whereby the rotation in either direction from the zero displacement position of either swash plate control arm engages one of said camming projections forcing said centering element to a shifted position against the force of the yieldable means whereby the centering element returns to its predetermined centered position upon release of the steering lever restoring the swash plates to neutral position.

4,043,417

TRACKED VEHICLE SUSPENSION SYSTEMS

Robert J. Orpana, Ste. Foy, Canada, assignor to Panatrac Manufacturing Corporation Limited, Toronto, Canada

Filed June 9, 1976, Ser. No. 694,103
Int. Cl.[2] B60G *11/22*; B62D *55/00*
U.S. Cl. 180—9.54 **10 Claims**



1. A tracked vehicle comprising:

a chassis supporting a power unit;

two track assemblies disposed at respectively opposite sides of said chassis and each including: an endless track; means for guiding the track in a closed path including a lower portion along which the track runs in contact with the ground; means drivably coupling the power unit and the track for driving the track in said path to propel the vehicle in use; and a plurality of ground wheels rotatable about axes normal to the forward direction of vehicle movement and arranged in rolling contact with the track along said ground-contacting portion of its path; and

a suspension system comprising:

in association with each of said track assemblies, a plurality of suspension arms, each rotatably supporting one of said ground wheels; and

a corresponding plurality of torsion cells, each coupling one of said arms to said chassis; each torsion cell comprising: an inner member having an outer surface which is of non-circular shape and which extends about a

longitudinal axis of the member; an outer tubular member having an inner surface which is of non-circular shape and which extends about said longitudinal axis, said outer member extending around said inner member to define a space between said members; a resilient elastomeric material disposed in said space and torsionally coupling said members; and a plurality of elongate elements extending longitudinally of and spaced equally about said outer surface of the inner member of the cell to mechanically key the inner member to said elastomeric material and provide, on said inner member, spaced stress-distribution surfaces tending to equalize throughout the elastomeric material, stresses produced in said material in response to relative turning movement between said inner and outer members when the cell is in use;

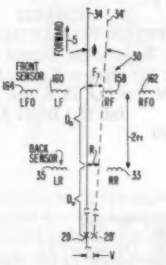
each said torsion cell being coupled to the chassis of the vehicle by one of its said inner and outer members so that the longitudinal axis of the cell extends parallel to the axis of rotation of the associated wheel and the other member of each cell being coupled to the relevant wheel suspension arm so that said arm defines an obtuse angle with respect to the direction of vehicle movement, whereby vertical travels over obstructions in use causes relative turning movement between said inner and outer members of the associated torsion cells and torsionally stresses the elastomeric material of the cell.

4,043,418

REVERSE DIRECTION GUIDANCE SYSTEM FOR LIFT TRUCK

Thomas R. Blakeslee, Woodside, Calif., assignor to Logisticon Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 629,491, Nov. 6, 1975. This application Dec. 29, 1975, Ser. No. 644,549
Int. Cl.[2] B62D *1/28*
U.S. Cl. 180—98 **10 Claims**



1. An improved, self-guided vehicle of the type which automatically follows an externally defined path in a forward direction and which has at least one ground engaging steerable wheel, sensor means mounted on the vehicle for generating a position error signal representative of the position of the vehicle with respect to the path, steering actuator means attached to the ground engaging steering wheel for steering the vehicle in response to a steering control signal to the steering actuator means, and steering circuit means supplied with the position error signal for generating a first steering control signal for the steering actuator means to cause the steering actuator means to automatically steer the vehicle along the external path, wherein the improvement comprises:

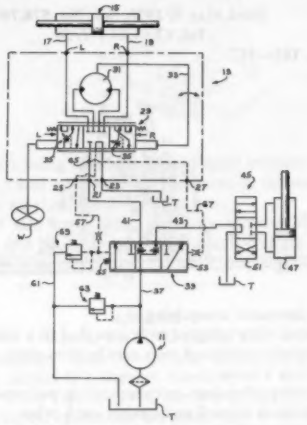
sensor means for generating the position error signal relative to a virtual sense point to the rear of the vehicle to guide the vehicle when it travels in a backward direction along the path.

4,043,419

LOAD SENSING POWER STEERING SYSTEM

Bernard J. Larson, New Hope; Oliver Wendell Johnson, Chaska, and James Kwok-fun Yip, Richfield, all of Minn., assignors to Eaton Corporation, Cleveland, Ohio

Filed June 4, 1976, Ser. No. 693,052
Int. Cl.[2] B62D *5/08*; F15B *11/16*
U.S. Cl. 180—132 **18 Claims**



1. A fluid control system for selectively effecting actuation of a power steering motor to steer vehicle wheels and an auxiliary device, said system comprising:

a. source of pressurized fluid;

b. a steering control valve disposed in series flow relationship between said fluid source and the steering motor, said steering control valve defining an inlet port and including valving movable selectively from a neutral position to right turn and left turn positions, a fluid meter including a metering element movable to measure the volume of fluid passing therethrough, and means coupling said metering member and said valving to impart follow-up movement thereto responsive to movement of said metering member;

c. said steering control valve and said valving defining fluid passage means including a first variable orifice operable to establish a fluid flow rate through said passage means, a second orifice operable to establish a fluid flow direction through said fluid meter, and a third orifice disposed between said fluid meter and the steering motor;

d. a flow control valve disposed in series flow relationship between said fluid source and said first variable orifice of said steering control valve, said fluid source comprising the sole source of pressurized fluid for actuation of the power steering motor and the auxiliary device, said flow control valve including an inlet port in fluid communication with said fluid source, a steering outlet port in fluid communication with said first variable orifice of said steering control valve, and an auxiliary outlet port in fluid communication with the auxiliary device;

e. said flow control valve including valve means disposed to control fluid flow from said inlet port to said outlet ports, and means biasing said valve means toward a position permitting substantially all of the system flow to pass from said inlet port to said steering outlet port;

f. meanns communicating a first pressure signal from immediately downstream of said first variable orifice to exert a biasing force on said valve means in the same direction as said biasing means; and

g. means communicating a second pressure signal from immediately upstream of said first variable orifice to exert a biasing force on said valve means in opposition to that of said biasing means to maintain a generally constant pres-

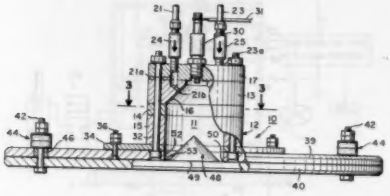
sure drop across said first variable orifice as said fluid flow rate varies between a minimum and a maximum.

4,043,420

HIGH FREQUENCY GAS DETONATOR

René Joseph Louis Zens, and William W. Horsman, both of Houston, Tex., assignors to William W. Horsman, Houston, Tex.

Filed May 5, 1975, Ser. No. 574,740
Int. Cl.[2] G01V 1/38
U.S. Cl. 181—117 **2 Claims**



1. A detonator comprising:

a bottom plate adapted to be coupled to a medium,

a top plate positioned over said bottom plate, said top plate having a bore;

a plurality of springs interconnecting and resiliently urging the plates toward and against each other;

a housing defining a detonation chamber having a bottom vent port opposite to and communicating with said bore, said housing being mounted above said top plate, whereby said bore is normally closed by said bottom plate;

fluid inlet means communicating with said chamber for admitting a charge of detonating fluid into said chamber and

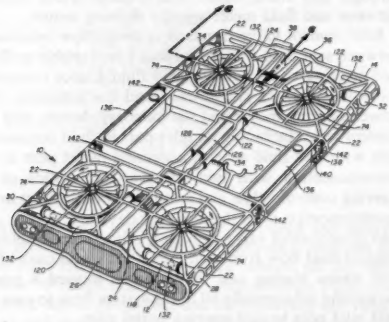
means for detonating the fluid inside said chamber, thereby causing a momentary separation of and the formation of a cavity between said plates, and said vent port exhausting the gaseous products of combustion from said chamber through said cavity to the ambient medium.

4,043,421

AIR CAR

Lonnell E. Smith, 613 E. 51st Pl. N., Tulsa, Okla. 74126

Filed Nov. 12, 1975, Ser. No. 631,109
Int. Cl.[2] B60V 1/00
U.S. Cl. 180—117 **4 Claims**



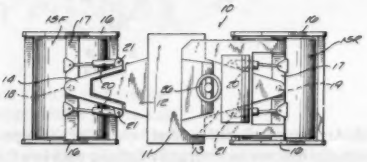
1. A vehicle capable of flying above the surface of the ground above the ground effect distance comprising a substantially rectangular frame structure defining a front end, a rear end, lateral side ends, a top and a bottom; a turbine engine mounted in the forward end of said vehicle and having an intake opening leading thereto at the forward end of said vehicle, a pair of rearwardly directed exhaust ports located adjacent the center of the rear of said vehicle and connected to the exhaust of said turbine, a pair of lateral exhaust openings adjacent the forward end of said vehicle and connected to the exhaust of said turbine, a pair of lateral exhaust ports located adjacent the rear of said vehicle and connected to the exhaust of said turbine, a pair of spaced fan assemblies mounted at the forward end of said vehicle and adjacent the sides thereof adapted to draw air from above said vehicle and force the same downwardly through openings at the bottom of said vehicle, a second pair of spaced fan assemblies mounted adjacent the rear of said vehicle and adjacent the sides thereof for drawing air from above the vehicle and forcing the same downwardly through openings at the bottom of said vehicle, means connected to the output of said turbine for driving said fan assemblies in unison, the fans adjacent one side of said vehicle rotating in a given rotary direction and the fans on the opposite side of said vehicle rotating in a direction opposite to said given rotary direction, each fan assembly including a plurality of horizontally and radially extending fan blades mounted for pivotal movement along a substantially horizontal pivot axis, each fan blade being pivotal around said horizontal pivot axis and means for pivoting the fan blades of the fan assemblies, and means for selectively restricting the flow from the exhaust ports of each diagonally opposite pair of exhaust ports, each fan assembly including a substantially vertical fan shaft, an inner hub mounted on said fan shaft, an outer hub spaced from said inner hub, each fan blade having an axle, one end of said axle being received in an opening in the inner hub and the opposite end of said axle being received in an opening in said outer hub, a yoke slidably mounted on said fan shaft above said inner hub, said yoke having a plurality of vertical rodes extending downwardly therefrom, each rod having an opening adjacent the lower end thereof, a pin received on the inner end of each fan blade adjacent the inner end of the axle thereof, each pin being adapted to be received in an opening at the lower end of an adjacent vertical rod, whereby, upon vertical reciprocation of said yoke, all of said fan blades can be turned around their axles in unison, and operator means for moving said yoke upwardly and downwardly along said fan shaft.

4,043,422

STEERING SYSTEM FOR ARTICULATED VEHICLES

John C. Barrett, Rogers, and Gerald T. Gfroerer, New Hope, both of Minn., assignors to Raygo, Inc., Minneapolis, Minn.

Filed Nov. 19, 1976, Ser. No. 743,394
Int. Cl.[2] B62D 5/08
U.S. Cl. 180—140 **9 Claims**



1. A fluid pressure responsive steering system for vehicles having transmission means by which the direction of travel of the vehicle is manually selectable, and having a steerable ground-engaging unit at each end of its chassis, so that by operator-controlled, power effected steering adjustment of said steerable units with respect to one another and the chassis, the progress of the vehicle over the ground in either a forward or a rearward direction can be steered, said system comprising:

A. reversible hydraulic motor means drivingly connected with each of said steerable units, operable to impart steering adjustment thereto;

B. manually operable steering valve means by which the functioning of said motor means may be commanded;

C. hydraulic circuit means having said manually operably steering valve means incorporated therein, for conducting

pressure fluid to said motor means from a source thereof in response to and under control of manual actuation of said steering valve means;

D. disabling valve means for each of said motor means connected in said hydraulic circuit means, operable when in its operative condition to render its respective motor means unresponsive to fluid pressure in said hydraulic circuit means;

E. check valve means connected in said hydraulic circuit means between each of the disabling valve means therein and its respective motor means, operable as a consequence of said disabling valve means being in its operative condition to prevent the flow of fluid to or from the motor means and thereby lock said motor means in the position to which it moved in response to its last steering command; and

F. control means operatively connected with said disabling valve means for governing the condition thereof,

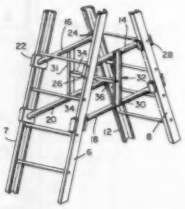
said control means being operatively connected with the vehicle transmission to automatically render one of said disabling valve means operative without affecting the other when the transmission is shifted to effect forward travel of the vehicle and vice versa when it is shifted into reverse, so that steering of the vehicle is effected by one of said motor means during travel of the vehicle in one direction and by the other of said motor means during travel of the vehicle in the opposite direction.

4,043,423

DEVICE FOR CONVERTING AN EXTENSION LADDER INTO A STEPLADDER

Norman Elias, 265-06, 80th Ave., Floral Park, N.Y. 11004, and Joseph Quinn, 326 Highland Ave., Kearny, N.J. 07032

Filed Aug. 24, 1976, Ser. No. 717,144
Int. Cl.[2] E06C *1/18, 1/24*
U.S. Cl. 182—22 **3 Claims**



1. A device for converting an extension ladder into a stepladder, comprising means for bracing a pair of spaced diverging top portions of a pair of extension ladder sections, said means comprising a pair of spaced clamping members having means for spacedly engaging opposite top portions of the extension ladder sections and adjustable means for securing said bracing means in rigid engagement with the opposite top portions of the extension ladder sections, wherein each of said pair of clamping members comprises a pair of spaced upper and lower bars, a channel securing each said pair of bars to one another midway of said bars and U-shaped clamp elements secured to each of the ends of said bars.

4,043,424

KNEELING APPARATUS FOR CEMENT MASONS

Auther Lee Crain, 9805 Anderson Mill Road, Austin, Tex. 78759

Filed June 7, 1976, Ser. No. 693,425
Int. Cl.[2] E04G *1/00;* A43B *3/00*
U.S. Cl. 182—230 **6 Claims**

1. A kneeling apparatus comprising

first and second platform means for independently supporting the knees and feet of a user;

first and second handle means fixedly attached to each of said platform means for relocating said platform means, one with respect to the other;

each of said platform means comprising a tray having upstanding peripheral side walls,

said trays being usable in spaced-apart relation such that one of said trays receives the knees of the user and the other receives the feet of the user,

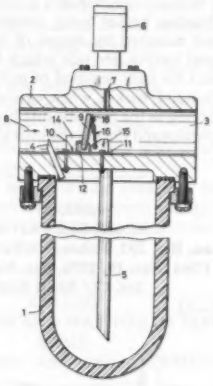
each of said trays being generally trapezoidal in shape with said handle means being attached to the truncated end portion of each of said trays, respectively.

4,043,425

OIL SPRAYING DEVICE

Gerhard Schützer, Stuhr-Moordeich, Germany, assignor to Gustav F. Gerdts KG, Bremen, Germany

Filed Feb. 25, 1976, Ser. No. 661,181
Claims priority, application Germany, Apr. 4, 1975, 2515447
Int. Cl.[2] F01M *1/08;* F16N *7/34*
U.S. Cl. 184—55 A **8 Claims**



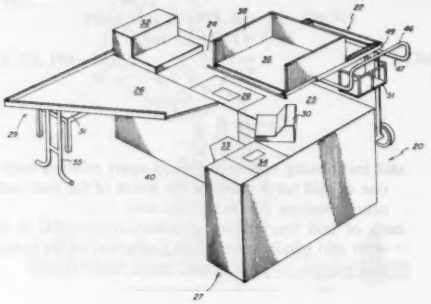
1. In an oil spraying device for the admixing oil with compressed air, said device including an oil container, a housing including an abutment, a passage line for the passage of the compressed air and a control flap including pivot prongs for pivotal support thereof in said passageway for automatically changing the free cross-sectional area of said passage line in dependence upon the pressure of the compressed air flowing therethrough, aid prongs defining a pivot axis, and a shank spring having two shank ends for loading said control flap in a locking direction, one of said shank ends being coupled with said control clap, and the other of said shank ends being coupled with said abutment, the improvement comprising:

means pivotally supporting and loosely coupling said one shank end on said control flap;

means pivotally supporting and loosely coupling said other shank end on said abutment; and

said shank spring including at least one spring winding connected with each said shank ends, said at least one spring winding being mounted outside of said pivot axis and being freely movable to change the effective leverage imparted by said shank spring onto said control flap.

4,043,426
COMBINATION CART-CHECKSTAND
David C. Verkler, 6 Nottingham Court, Montvale, N.J. 07645
Filed Oct. 26, 1976, Ser. No. 735,246
Int. Cl.[2] E04H *3/04*; B62B *11/00*
U.S. Cl. 186—1 AC **8 Claims**



1. A combination cart-checkstand for a merchandise checkout system in self-service stores comprising in combination:

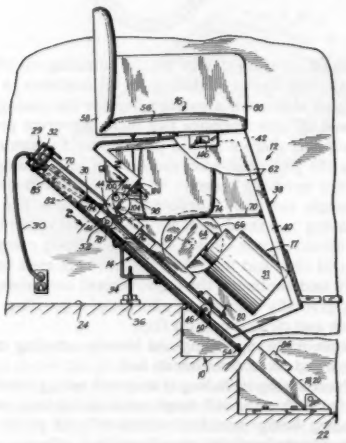
a checkstand having a cash register, at least one bagging station, and having immediately adjacent to said cash register and bagging station provision for a cashier;

a merchandise cart comprising a frame having handles and having a merchandise basket slidably mounted on said frame such that said merchandise basket may be moved laterally toward said cashier's position;

said merchandise basket being substantially rectangular in shape and mounted by means of full suspension sliding rollers, and having one side which folds down and under said basket for easy removal of merchandise;

said merchandise basket when extended over said checkstand, serving as the merchandise holding and storage area of said checkstand during the checking and bagging operations.

4,043,427
STAIR ELEVATOR
Ray Ackerman, Rte. 292, Holmes, N.Y. 12531
Filed Mar. 19, 1976, Ser. No. 668,707
Int. Cl.[2] B66B *9/08*
U.S. Cl. 187—12 **4 Claims**



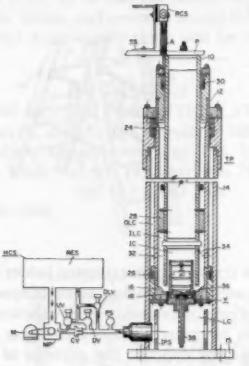
1. In a stair elevator, including a track having rails adapted for support on a stairway, a chair unit movable on the track, a reversible driving motor for moving said chair unit along the track, the improvement comprising:

a control switch mounted on the chair unit for operation by the user;

upper and lower limit switches automatically actuatable at the respective upper and lower ends of the track, and an emergency switch automatically actuatable at the upper end of said track;

each of said limit and emergency switches comprising a switch contact assembly, and a cooperating individual magnet, the switch contact assembly or the cooperating individual magnet of both the upper limit switch and the emergency switch being mounted on said chair unit in closely spaced side-by-side staggered relationship and the other of said switch contact assembly or said cooperating individual magnet, being mounted on opposite sides of the switch contact assembly or the cooperating individual magnet mounted on said chair unit and between said rails, so that as the individual contact assemblies are moved relative to the individual cooperating magnets, the emergency switch is actuated after said upper limit switch has been actuated.

4,043,428
AUTOMATIC RECYCLE CONTROL FOR HYDRAULIC ELEVATORS WITH TELESCOPIC CYLINDERS
Lawrence Eugene White, Harrington Park, and Arthur Brantlyn Woolsey, Ridgewood, both of N.J., assignors to Otis Elevator Company, New York, N.Y.
Filed Dec. 10, 1975, Ser. No. 639,520
Int. Cl.[2] F15B *11/18, 13/16*
U.S. Cl. 187—17 **5 Claims**



1. Apparatus for use with a hydraulic fluid elevator system operating an elevator car serving a plurality of landings and capable of causing the car to position itself at its lowest landing comprising:

a hydraulic telescoping piston arrangement having an outer cylinder, an intermediate piston and an inner piston supporting said car, said inner piston hydraulically sealed within and extendible from said intermediate piston and said intermediate piston hydraulically sealed within and extendible from said outer cylinder forming therein communicable longitudinal chambers containing a first body of hydraulic fluid;

hydraulic control means including a source of hydraulic fluid connected to said outer cylinder for transferring hydraulic fluid thereto from said source causing said inter-

mediate piston and said inner piston to move relative to said outer cylinder;

a hydraulic valve assembly mounted on one end of said intermediate piston within said outer cylinder forming therein a lower chamber for receiving transferred hydraulic fluid from said source, said hydraulic valve assembly operable to a first position for separating said fluid containing communicable longitudinal chambers from said lower chamber thereby forming within said longitudinal chambers a closed fluid power transmission system operable to move said inner piston relative to said intermediate piston in response to the transfer of fluid between said hydraulic control means and said lower chamber, and said valve assembly operable to a second position for transferring hydraulic fluid between said fluid containing longitudinal chambers and said lower chamber; and

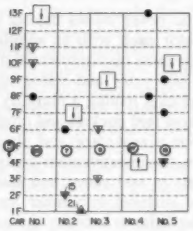
power control means responsive to the location of said car at its lowest landing actuating said hydraulic control means to cause said intermediate and inner piston to move downwardly relative to said outer cylinder to operate said hydraulic valve assembly to its second position to cause transferred hydraulic fluid to be supplied from said source through said lower chamber to said fluid containing longitudinal chambers when an insufficient amount of fluid exists within said longitudinal chambers, and to return said elevator car to its lowest landing when said fluid insufficiency no longer exists.

4,043,429

ELEVATOR CAR GROUP CONTROL SYSTEM

Kotaro Hirasawa; Soshiro Kuzunuki, both of Hitachi; Tatsuo Iwasaka, and Takashi Kaneko, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 30, 1975, Ser. No. 645,345
Claims priority, application Japan, Jan. 6, 1975, 50-43
Int. Cl.[2] B66B *1/18*
U.S. Cl. 187—29 R **7 Claims**



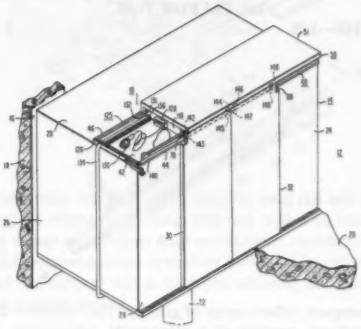
1. An elevator car group control system for controlling a plurality of elevator cars arranged for parallel operation for serving a plurality of service floor landings of a building, comprising hall call registering means disposed at the landing of each floor for originating hall calls, cage call registering means disposed in each said car for instructing target floors, waiting time display means disposed at the landing of each floor, means for selecting suitable ones of said cars for serving hall calls, means for allotting the hall calls to said selected cars, and means for forecasting the length of time required for each of said selected cars to arrive at the landing of each of the allotted hall call originating floors and displaying the forecast waiting time on each of said display means, said serving car selecting means comprising means for detecting for each said car the number of floors subject to change in forecast waiting time displayed at each of the already allotted floors when a new hall call is originated from one of the floors and one of the cars is selected to respond to the new hall call, and means for preferentically selecting the car detected to provide a smaller number of floors subject to change in displayed forecast waiting time than the others.

4,043,430

ELEVATOR SYSTEM HAVING COMMON ENCLOSURE FOR OPEN WIRING BETWEEN DOOR CONTROLS, CAR TOP INSPECTION STATION CONTROLS AND TRAVELING CABLE

Joseph K. Kraft; Robert A. Sette, both of Gettysburg, and Leigh F. Jackson, Fayetteville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 608,481, Aug. 28, 1975, Pat. No. 4,004,655. This application May 6, 1976, Ser. No. 684,060
Int. Cl.[2] B66B *13/00*
U.S. Cl. 187—52 R **1 Claim**



1. An elevator system, comprising:

an elevator car having side, bottom and top portions with a passenger opening in a side portion thereof,

an enclosure on the top portion of said elevator car,

door operator controls in said enclosure,

said door operator controls including a drive motor, door position switches, and terminal blocks,

a traveling cable having a plurality of conductors, at least certain of which enter said enclosure,

and controls for a car top inspection station mounted on a wall of said enclosure,

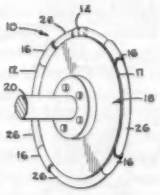
and open electrical wiring in said enclosure between said door operator controls, said controls for the car top inspection station, and said at least certain of the conductors of said traveling cable.

4,043,431

VIBRATION DAMPER AND METHOD OF MAKING THE SAME

Weldon B. Ellege, Conway, Ark., assignor to FMC Corporation, San Jose, Calif.

Continuation of Ser. No. 527,980, Nov. 29, 1974, which is a continuation of Ser. No. 446,565, Feb. 27, 1974, abandoned. This application Feb. 20, 1976, Ser. No. 659,821
Int. Cl.[2] F16F *15/12*
U.S. Cl. 188—1 B **17 Claims**



1. A vibration damper for inhibiting resonant vibrations in a brake rotor during refacing, said damper comprising: an elastic band having a relaxed length less than the circumference of the

rotor; means for interconnecting the free ends of said band to form a loop; and a plurality of apertured weights strung on said elastic band, the outside diameter of said band in relaxed condition being larger than the apertures in said weights.

4,043,432

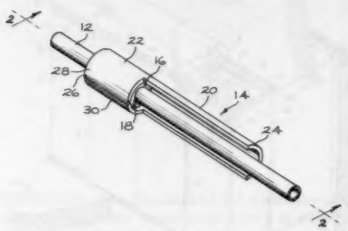
COMPACT VIBRATION DAMPER FOR A HERMETIC REFRIGERANT COMPRESSOR

Owen H. Scheldorf, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Continuation-in-part of Ser. No. 584,196, June 5, 1974, abandoned. This application Dec. 9, 1976, Ser. No. 748,910

Int. Cl.[2] F16F *7/10*

U.S. Cl. 188—1 B **1 Claim**



1. A compact, offset center of gravity type vibration damper for the exhaust conduit of a refrigerant compressor, which damper comprises:

an annular body of elastomeric material sized for encircling a portion of the conduit intermediate the ends thereof; and

a unitary element having clamping and mass portions, said clamping portion being generally cylindrical, deformable, and having a longitudinal slot to permit clamping about said elastomeric body without requiring access to the ends of the conduit, and said mass portion being longitudinally extended and semi-cylindrical with the cylindrical center of curvature substantially coincident with the longitudinal axis of the conduit;

whereby the center of gravity of said element is axially and radially offset from the point of attachment to said elastomeric body, and said damper is readily applied to the conduit.

4,043,433

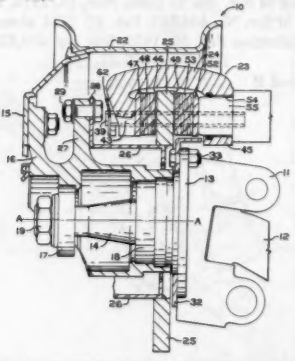
CALIPER BRAKE SLIDER SUPPORT

Jack D. Rainbolt, Troy, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Sept. 13, 1976, Ser. No. 722,985

Int. Cl.[2] F16D *55/224*

U.S. Cl. 188—73.4 **6 Claims**



1. A U-shaped slider support member for a caliper brake comprising spaced-apart, parallel, longitudinally extending rail members for sliding engagement with a transversely extending caliper member and transversely extending friction lining carriers, a separate tie bar connecting said rail members, said tie bar including a transversely extending plate member with a transversely extending first surface, the ends of said plate member having end flanges, said end flanges and said rail members extending generally perpendicular to said first surface in side-by-side relationship and each of said end flanges being fastened to one of said rail members.

4,043,434

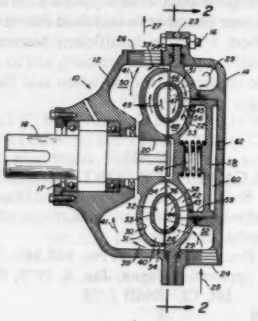
MECHANICALLY ADJUSTABLE DUAL POCKET HYDROMATIC BRAKE

Steve A. Braschler, Coffeyville, Kans., assignor to Parmac, Inc., Coffeyville, Kans.

Continuation-in-part of Ser. No. 501,772, Aug. 29, 1974, abandoned. This application Apr. 13, 1976, Ser. No. 676,487

Int. Cl.[2] F16D *57/04*

U.S. Cl. 188—296 **12 Claims**



1. In a hydro-kinetic brake means having at least a single rotor and a single stator each with an annular liquid pocket facing each other at the same circumferential distance from the axis of rotation and said rotor and stator spaced a selected distance apart, each pocket having a plurality of planar vanes extending radially across said pockets and tilted in said rotor in the direction of rotation of said rotor, and tilted in the opposite direction in the stator, the improvement comprising:

said annular pockets in said stator and said rotor each divided by walled surfaces into inner smaller and outer larger pockets the distance between the outer wall surface of said inner pocket and the inner wall surface of said outer pocket being constant, said inner and outer pockets having the same curved configuration, said vanes in said outer pockets continuing across said inner pockets;

conduit means in said vanes in said stator pockets, said conduit means having its liquid inlet at the back of said outer pockets in said stator and its liquid outlet radially located at the space between said rotor and stator within said inner pockets to provide initial continuous liquid flow into said inner pockets through the space between said stator and rotor, thence into each of said outer pockets during rotation of said rotor;

a cylindrical groove co-axial with the axis of rotation cut through the back of the stator and the vanes in the outer pocket, said groove being located such that the outer perimeter of said groove is within the radial location of said conduit outlets;

right circular cylindrical means, located within said groove, said cylindrical means being non-rotative and adapted to axially reciprocate in said groove;

said inner and outer pockets, said groove, and said cylindrical means located relative to each other such that a tangent to the curvature of the walled outer surface of said

inner pocket and a tangent to the curvature of the walled inner surface of said outer pocket at their point of intersection with the outer surface of said cylindrical means will be perpendicular to said outer surface of said cylindrical means; and

means to reciprocate said cylindrical means.

4,043,435

ARRANGEMENT FOR ADJUSTING THE DAMPING FORCE OF A SHOCK ABSORBER

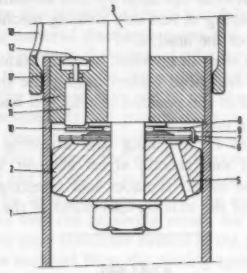
Cornelis DeKock, Oud-Beijerland, and Floris Hendrik Breure, Zuid-Beijerland, both of Netherlands, assignors to ITT Industries, Inc., New York, N.Y.

Filed May 6, 1976, Ser. No. 683,922

Claims priority, application Netherlands, June 2, 1975, 7506497

Int. Cl.[2] F16F *9/34*

U.S. Cl. 188—319 **6 Claims**



1. An arrangement for adjusting the damping force in the piston of a telescopic shock absorber comprising a cylinder having a cover enclosing a piston and a piston rod connected to said piston, said piston rod extending through said cylinder cover to be movable therethrough, the damping force of the shock absorber being determined by the position of an adjusting member rotatable about said piston, said adjusting member positioning closure members which regulate the size of a passage in the piston, said adjusting member being held in a position through engagement with a stop member in the end position of the piston near said cylinder cover, said stop member being movable axially in said cylinder cover and being engageable from outside said cylinder cover to assume an operative position through which by rotating said piston by means of said piston rod, rotation of the adjusting member is thereby prevented, the part of the piston rod extending outside said cylinder being surrounded by a coaxial protecting sleeve rotatable around said piston rod and connected at one end with said piston rod, said protecting sleeve completely surrounding the extending part of said piston rod when said piston is in the end position near said cylinder cover, and an opening in said protecting sleeve through which said stop member is accessible.

4,043,436

SUPPORT APPARATUS FOR ELECTRICALLY CONDUCTIVE RAIL

William R. Segar, and Robert A. Larson, both of Monroeville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

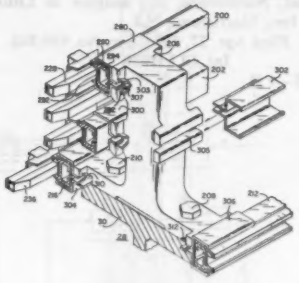
Filed May 6, 1976, Ser. No. 684,057

Int. Cl.[2] B60M *1/34*

U.S. Cl. 191—32 **7 Claims**

1. A support apparatus for a conductive rail operative with a vehicle moving along a roadway including spaced tracks and a guide beam having an upper flange and supported between those tracks, said vehicle having an electric motor connected to a collector shoe, the combination of:

rail support means positioned above and coupled to the upper flange of said guide beam for positioning said rail substantially parallel to said spaced tracks such that said collector shoe cooperates with said rail to energize said motor, with said rail support means including an insertion slot, and



rail mounting means coupled between said rail and said rail support means for holding said rail, with said rail mounting means including at least one fastener member having a predetermined shape operative with said insertion slot of said rail support means to fasten securely said rail to said rail support means.

4,043,437

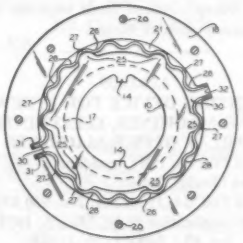
TORQUE LIMITING CLUTCH BRAKE

Frederick P. Taylor, Bridgeport, N.Y., assignor to Lipe-Rollway Corporation, Syracuse, N.Y.

Filed Dec. 19, 1975, Ser. No. 642,350

Int. Cl.[2] F16D *3/66*

U.S. Cl. 192—13 R **5 Claims**



1. In a friction clutch for connecting driving and driven shafts, the clutch including a release mechanism for effecting disengagement of the clutch, the improvement comprising a clutch brake cooperable with the release mechanism and a stationary surface adjacent the clutch comprising an inner annular plate keyed to the driven shaft, means encircling the inner plate and arranged to be moved by the release mechanism into engagement with the stationary surface during disengagement of the clutch, the encircling means including friction facing material where it is engaged by the release mechanism and stationary surface, and means yieldably connecting the encircling means to the inner plate including a plurality of uniformly spaced arcuate projections on the outer periphery of the inner plate and spring means connected to the encircling means and releasably engaging at least some of the projections, the spring means comprising a plurality of fluted spring strips having fitted portions at least some of which mate with the plate arcuate projections, the spring means being arranged to release and then re-engage the projections to permit relative movement between the encircling means and inner plate when

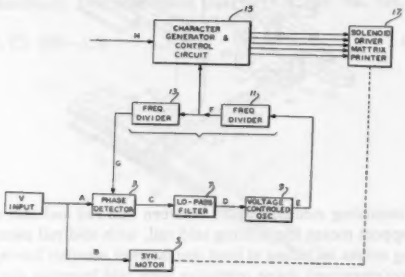
the force applied to the encircling means by the release mechanism exceeds a predetermined amount.

4,043,438

PRINTING CONTROL CIRCUIT

Lester Avant, Northbrook, Ill., assignor to Litton Business Systems, Inc., Morristown, N.J.

Filed Apr. 27, 1976, Ser. No. 680,848
Int. Cl.[2] H03K *17/74*
U.S. Cl. 197—1 R **5 Claims**



1. A printing control circuit comprising:

a means for transmitting line voltage,

a phase-lock loop circuit, the input of which is coupled to said means for transmitting line voltage,

printing means, coupled to the output of said phase-lock loop circuit, and

motor means, coupled to said printing means and said means for transmitting line voltage, for moving said printing means,

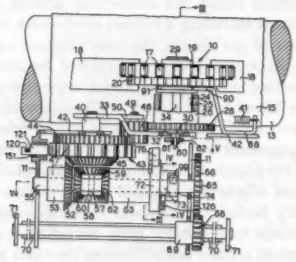
said phase-lock loop circuit including a first and second frequency divider means, the output of said phase-lock loop circuit being coupled from between said first and second frequency divider means.

4,043,439

SERIAL PRINTING DEVICE FOR TYPEWRITERS, ACCOUNTING MACHINES, TELEPRINTERS AND SIMILAR OFFICE MACHINES

Dante Daly, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Feb. 24, 1976, Ser. No. 660,930
Claims priority, application Italy, Mar. 5, 1975, 67554/75
Int. Cl.[2] B41J *1/50, 23/04*
U.S. Cl. 197—18 **12 Claims**



1. In a serial printing device for typewriters, accounting machines, teleprinters, and similar office machines, comprising a platen, a carriage mounted adjacent to said platen, a type head mounted on said carriage and carrying a plurality of characters thereon, said type head being rotatably movable and laterally movable between a rest position and a printing position, and continuously rotating driving means, the combination of:

first means for connecting said head to said driving means for continuously rotating said head to sequentially present said characters in front of said platen;

arresting means operatively interconnected to said first means for selectively operating said first means and operatively interconnected with said head for arresting the rotation of said head so as to position a selected character of said plurality of characters in front of said platen;

a striking mechanism connectable to said head and selectively actuatable for moving said head towards said platen to said printing position;

second means for connecting said driving means to said striking mechanism for the actuation thereof;

actuating means for alternately operating said first and said second connecting means for selectively actuating either said arresting means or said striking mechanism;

a first arrest element operated by said actuating means for normally keeping at rest said striking mechanism during the rotation of the head;

a second arrest element operated by said striking mechanism for keeping said head locked during the striking movement thereof in the position at which it was arrested by said arresting means; and

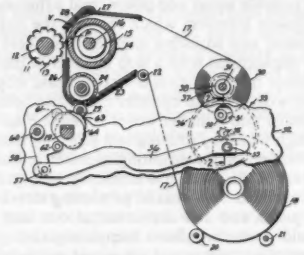
restoring means for releasing said arresting means upon operation of said second arrest element whereby said second arrest means replaces said arresting means until completion of the striking movement of the head.

4,043,440

PAPER FEED AND WEB REWIND MECHANISM

Richard E. Busch, La Puente, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.

Filed Apr. 8, 1976, Ser. No. 674,900
Int. Cl.[2] B65H *17/04*; B41J *15/16*
U.S. Cl. 197—114 R **10 Claims**



1. In a printer having mechanism for printing characters onto a record strip at a printing station,

feed means for advancing said strip to carry said characters from said printing station to a viewing station and for thereafter retracting said strip, and

means forming a rewind roll for said strip;

a rewind drive mechanism for said roll comprising

an oscillating drive means,

means comprising a one-way drive device operable in an advancing direction to impel said rewind roll to take up a certain amount of slack in said strip resulting from advancement of said strip by said feed means, and

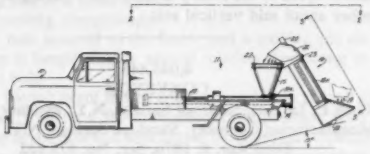
means operable by said drive means when moving in one direction for actuating said drive device in said advancing direction thereof,

the mass of said rewind roll being effective to cause said rewind roll to overtravel relative to said drive device whereby to take up any remaining slack in said strip.

4,043,441
MOBILE PUMP

John R. Johnson, Arcadia, Calif., assignor to Royal Industries, Inc., Pasadena, Calif.

Filed Nov. 10, 1975, Ser. No. 630,207
Int. Cl.[2] B65G *33/14*
U.S. Cl. 198—317 1 Claim



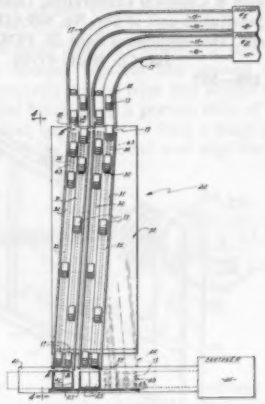
1. As an article of commerce, conveying apparatus for conveying moist, compressible materials such as plaster, concrete, mortar and the like as received from a mobile material mixing device having material discharge means for conveyance to a material pump wherein the material inlet for the pump is at a height above the material discharge means of the mixing apparatus so that the material may not be readily discharged from the mixing device into the pump, the article of commerce comprising a pump for pumping moist compressible materials and having means integral therewith for receiving the material to be pumped and having a fixed, preselected height above the ground level of the pump, and conveying means mounted at one end to the material receiving means for the pump to be carried thereby and extendable outside of the pump for readily conveying the material from the mixing apparatus to the receiving means, the conveying means being constructed and defined to be rotatably extendable at an inclined relationship to the pump to a preselected point below the height of the pump receiving means and to be rotated to a position to facilitate receiving the material at the free end thereof from said mobile material mixing device, said material receiving means comprising an upstanding material hopper having means for rotatably mounting said conveying apparatus adjacent the upper rim of the hopper, said rotatable mounting means comprises swivel collar means mounted adjacent the upper rim of the hopper for rotatably mounting said conveying means to permit the conveying means to rotatably ride on the swivel collar means for permitting the conveying means to be positioned at various radial material loading positions with respect to the upper rim of the hopper.

4,043,442
TRANSFER MECHANISM

Joseph Daniel Greenwell, Florence, Ky., and Eric W. Scarpa, Cincinnati, Ohio, assignors to R. A. Jones & Co. Inc., Covington, Ky.

Filed Aug. 18, 1975, Ser. No. 605,229
Int. Cl.[2] B65G *47/26*
U.S. Cl. 198—420 9 Claims

1. Transfer mechanism for pouches comprising:
a frame,
a plurality of slow upstream conveyors on said frame,
means for depositing shingled groups of pouches on said upstream conveyors in longitudinally staggered relation,
a plurality of fast downstream conveyors on said frame and having upstream ends overlapping at least the downstream ends of said slow conveyors,
first check and release means at the intersection of said fast and slow conveyors,
and second check and release means at the downstream ends of said fast conveyors,
said upstream and downstream conveyors each comprising a plurality of thin endless belts passing over spaced pulleys,
and means for selectively raising the belts for the slow conveyors when said first check and release means checks said pouches and raising said belts for said fast conveyors

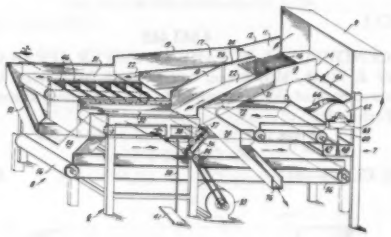


when said first check and release means releases said pouches.

4,043,443
FRUIT SUB-SAMPLER AND GRADING TABLE

Michael O'Brien, Davis, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Sept. 15, 1975, Ser. No. 613,251
Int. Cl.[2] B65G *47/26*
U.S. Cl. 198—525 11 Claims



1. A fruit sub-sampler and grading table comprising a frame having an entrance end and an exit end, means for delivering by gravity a randomly arranged supply of a plurality of fruit to said entrance end, means for dividing said supply into a continuously running first random stream and a continuously running second random stream, means for advancing said first stream on said table toward said exit end, means for splitting said advancing first random stream into a primary stream in a primary path and a secondary stream in a secondary path, said paths being separated by an intervening space, means on said frame for automatically segregating a fractional quantity of fruit from said second stream, and means for varying said fractional quantity, primary and secondary belt conveyors on said frame defining portions of said primary and secondary paths, means for advancing said belt conveyors, and plural container means in said space for receiving fruit.

4,043,444

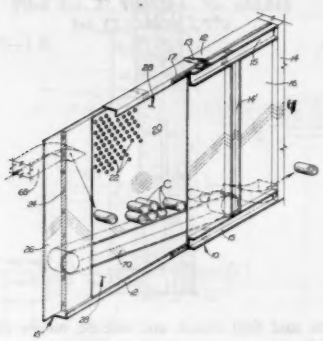
CUP ACCUMULATOR ASSEMBLY

Michael S. Bobeczko, Castro Valley, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 609,633, Sept. 2, 1975, abandoned. This application June 28, 1976, Ser. No. 700,439

Int. Cl.² B65G *47/08*

U.S. Cl. 198—557 **3 Claims**



1. An accumulator and storage device for metal containers that are provided with one open and one closed end, said device being comprised of a relatively sound-proof and enclosed container receiving and storage chamber, said chamber having a top, bottom, two end, and two side walls and said chamber having a width slightly in excess of but a depth and length both greater than the length of the containers to be stored, one of the sidewalls of the said chamber which faces the open ends of the containers and also constitutes a major wall area of the chamber comprising an acoustical wall that includes an inner perforated liner sheet and an outer backer sheet of sound absorptive material arranged and disposed adjacent the liner sheet, conveyor means for initially selectively depositing and orienting the containers in the said enclosed chamber with their open ends facing the said acoustical wall and said chamber also being provided with container outlet means in the lower portion thereof.

4,043,445

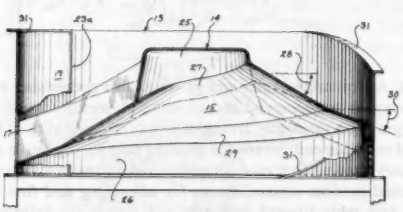
CENTRIFUGAL ROTARY TRANSFER APPARATUS

Gary J. Wirth, Milwaukee, and Kenneth M. Gelder, Germantown, both of Wis., assignors to S.I. Handling Systems Inc., Easton, Pa.

Filed Feb. 10, 1975, Ser. No. 548,297

Int. Cl.² B65G *37/00*

U.S. Cl. 198—611 **6 Claims**



1. A rotary transfer apparatus comprising a rotary member for discharging of a load by centrifugal force and having a vertical axis of rotation and at least one generally vertical planar transfer surface extending outwardly radially of said axis and having a lower edge, said rotary member having at least one load supporting surface extending circumferentially from the lower edge of said transfer surface to form a generally horizontal load support, said supporting surface extending along the lower edge of the transfer surface and projecting upwardly and around said axis in the direction of rotation from the lower edge of said vertical transfer surface and inclined downwardly from the central portion of the rotary member to define a substantially spiral-conical configuration, an outer guide wall means mounted in close encirclement about the rotary member and having a discharge opening, and a drive means coupled to the rotary member for rotating of the rotary member about said vertical axis.

4,043,446

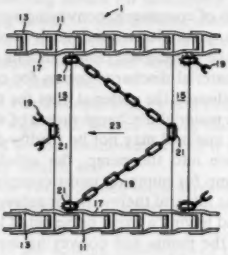
CONVEYOR

William P. Tarrant, Saratoga Springs, N.Y., assignor to Tarrant Manufacturing Company, Saratoga Springs, N.Y.

Filed Apr. 8, 1976, Ser. No. 675,132

Int. Cl.² B65G *19/00*

U.S. Cl. 198—728 **8 Claims**



1. A conveyor, adapted to be driven by drive means, for uniform, continuous and positive conveying of material, said conveyor comprising: first flexible means, a plurality of rigid means and a pluralty of second flexible means; said first flexible means being adapted to being driven by said drive means, said first flexible means carrying said rigid means, said rigid means being disposed substantially normal to said first flexible means, said rigid means carrying therebetween said second flexible means, each of said second flexible means being angularly disposed relative to said rigid means, each of said second flexible means being carried substantially at the lateral sides of said rigid means and substantially at intermediate portions of the next adjacent rigid means, and said rigid means and said second flexible means cooperating to uniformly, continuously and positivelt convey said material, and said second flexible means cooperating to clear away said material being conveyed from said first flexible means thereby preventing said material being conveyed from entering and packing into said first flexible means to thereby prevent malfunction of said conveyor, and said second flexible means cooperating with said rigid means respecting the spatial relationship of said rigid means to render said conveyor more flexible, and, respecting that part of said conveyor under its said load run and said second flexible means and rigid means of said part of said conveyor, said second flexible means of said part of said conveyor under its said load run cooperating to reinforce said rigid means of said part of said conveyor under its said load run by cooperatively sharing the loads and forces acting upon said part of said conveyor under its said load run.

4,043,447

QUICK RELEASE TROUGHING ROLL MOUNTING

Charles E. Donnelly, Rexdale, and Richard G. Sauve, Toronto, both of Canada, assignors to FMC Corporation, San Jose, Calif.

Filed Dec. 3, 1975, Ser. No. 637,447

Int. Cl.² B65G *15/08*

U.S. Cl. 198—827 **5 Claims**

1. In a conveyor having a longitudinal extending endless belt with a conveying surface in the form of a trough, a series of

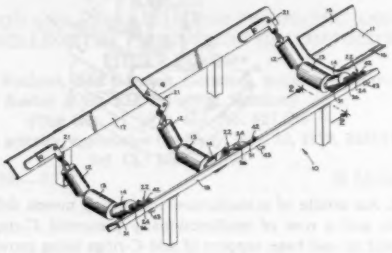
rotatable troughing rolls that are coupled together in a chain-like manner for supporting the belt, said troughing rolls extending laterally of the belt beneath the same with the outermost rolls being inclined to provide lateral support for the sides of the belt thereby shaping the belt in the form of a trough, and a quick release mounting for securing one end of an inclined troughing roll to a fixed frame,

said mounting comprising:

a pivot bolt secured to the frame and a locking pin on said frame in longitudinally spaced relation therealong to said pivot bolt,

an arm having pivot means and locking means spaced longitudinally thereon for independent cooperation with said frame pivot bolt and said frame locking pin, respectively,

said arm pivot means cooperating with said frame pivot bolt to permit pivotal movement of said arm about the bolt in a plane that extends parallel with the adjacent inclined side of the belt,



and between a first position holding the troughing rolls in load-receiving contact with the belt and a second position wherein the troughing rolls are lowered from belt contact,

a coupling interconnecting one end of the inclined troughing roll and said arm, said inclined roll having an axis along which a line of force extends therefrom through said coupling and to said arm, with said force axis lying substantially in said pivotal plane of said arm,

the centerline of said locking pin being positioned on said line of force when said arm is in said first position thereby to apply the troughing roll load to said locking pin,

said locking means cooperating with said arm locking means for retaining said arm in said first position, said pivot bolt thereby being spaced laterally from said force axis when said arm is in said first position, and

means mounting said locking pin for movement with respect to said arm locking means to release the arm for pivotal movement about said spaced pivot bolt to said second position removing the troughing rolls from the belt contact.

4,043,448

CHILD-PROOF CONTAINER

Yoshinobu Tanaka, Toyonaka, Japan, assignor to Alpha Techno Company, Ibaraki, Japan

Filed June 23, 1976, Ser. No. 698,995

Claims priority, application Japan, June 24, 1975, 50-89414

Int. Cl.[2] B65D *43/16, 55/02*

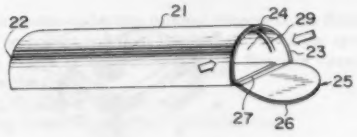
U.S. Cl. 206—1.5 **7 Claims**

1. A container defining an opening, said container including an integral cover for covering said opening, and being difficult for children to both recognize and open, said container comprising:

a tubularly-shaped main housing formed of a resilient material having internal and external surfaces and first and second end edges;

a bottom wall integrally formed with said tubularly-shaped main housing adjacent said first end edge of said main housing, said bottom wall permanently closing a first end of said tubularly-shaped main housing by being integrally attached to said housing about the bottom wall's perimeter;

a cover integrally formed with said tubularly-shaped main housing adjacent said second end edge of said main housing, said cover being integrally attached to said tubularly-shaped main housing adjacent said second end edge thereof, but inwardly spaced from said second end edge, said attachment being along a portion only of the outer perimeter of said cover so as to form a hinge means inwardly spaced from said second end edge for allowing



said cover to be selectively rotated between a closed position closing a second end of said main housing and an open position rotated outwardly from said main housing;

said internal surface of said tubularly-shaped main housing including a slot for receiving a free edge of said cover when said cover is in a closed position, said slot forming a shoulder located inwardly from said second end edge, for engaging an inner surface of said cover to prevent further inward rotation of said cover from said closed position such that an outer surface of said cover is spaced inwardly from said second end edge of said tubular main housing when said cover is in said closed position.

4,043,449

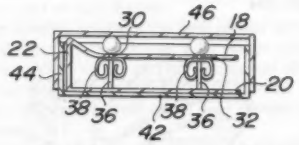
GIFT PACKAGE CONTAINING MESSAGE BEARING UNIT AND USEFUL ARTICLE IN ASSOCIATION THEREWITH

Michael Love, Philadelphia, Pa., assignor to Mida Mfg. Inc., Philadelphia, Pa.

Filed Sept. 19, 1975, Ser. No. 616,756

Int. Cl.[2] B65D *5/50, 73/00, 1/34*

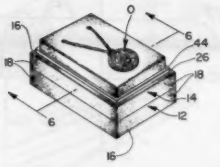
U.S. Cl. 206—45.14 **3 Claims**



1. A gift package comprising a card having decorative matter and message-bearing indicia thereon, means on said card for coupling a gift article thereto, a gift article removably coupled to said card and having a portion thereof juxtaposed to said decorative matter so that said decorative matter and said portion create an integrated visual effect, said card comprising first and second leaf members coupled to each other so as to be openable in book fashion, said gift article being coupled to said first leaf member, and a container for said card and said gift article, said container comprising a receptacle portion, said card being nestable within said receptacle portion, and a cover portion for enclosing said card and said gift article, said receptacle portion comprising bottom wall and spaced side walls, said second leaf member of said card overlying said bottom wall when said card is nested within said receptacle portion, and a portion of said gift article projecting into engagement with said second leaf member so as to maintain said first leaf member in spaced relation with respect to said second leaf

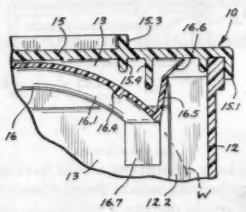
member when said card is nested within said receptacle portion.

4,043,450
DISPLAY BOX CONSTRUCTION
Owen G. Rielly, Lincoln, R.I., assignor to Frost Packaging Company, Pawtucket, R.I.
Filed Jan. 24, 1977, Ser. No. 762,464
Int. Cl.[2] B65D *5/50, 1/34*
U.S. Cl. 206—45.14 **10 Claims**



1. A box for the display of jewelry and the like in alternative open and closed positions comprising, generally open face cover and base sections adapted for face to face disposition to each other in a closed position and hingedly connected to each other along a common line for spaced apart disposition in an open position, an insert having a generally planar surface for the receipt and display of said jewelry and the like and sidewalls downwardly extending from said display surface, said insert adapted for disposition within said base section of said box for containment therein and display in said open position, said cover section having a top surface, said top surface including means for temporarily frictionally positioning said insert sidewalls whereby said insert may be positioned on said top surface of said cover for alternative display of said jewelry and the like when said box is in its closed attitude.

4,043,451
SHIPPING CONTAINER FOR SILICONE SEMICONDUCTOR WAFERS
Douglas M. Johnson, Waconia, Minn., assignor to Fluoroware, Inc., Chaska, Minn.
Filed Mar. 18, 1976, Ser. No. 668,204
Int. Cl.[2] B65D *73/02, 85/42, 81/02*
U.S. Cl. 206—334 **18 Claims**

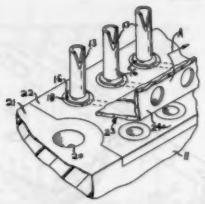


2. A shipping container for frangible wafers and the like, comprising:

an elongate receptacle having side and bottom walls and a removable lid to provide access into the interior chamber wherein such wafers are received and stored, the receptacle having wafer-locating means maintaining the wafers in spaced and confronting relation to each other and oriented transversely of such side walls; and

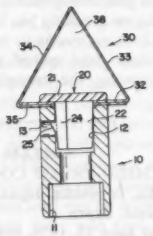
means in the receptacle and adjacent the lid to engage and restrain such wafers, and including an elongate wafer support adjacent the lid within the interior chamber and extending longitudinally thereof to overlie the wafers, said wafer support being formed of soft, springy plastic and having a lower wafer-engaging face with corrugations formed therein to receive and locate and retain the wafers in predetermined positions, each of said supports having a plurality of resiliently flexible spring leaves projecting outwardly away from the wafers and upwardly into engagement with the lid, and said leaves flexing against the lid and resiliently urging the wafer support inwardly of the interior chamber and against the peripheral edges of the wafers to restrain the wafers against movement in the receptacle during transport.

4,043,452
C-RING HOLDER
Milton I. Ross, 400 College Ave., Haverford, Pa. 19041
Filed Sept. 23, 1976, Ser. No. 725,962
Int. Cl.[2] B65D *85/24*
U.S. Cl. 206—343 **4 Claims**



1. An article of manufacture comprising means defining a base, and a row of unidirectionally presented C-rings supported on said base, support of said C-rings being provided by frangible means, and the center-to-center spacing of said C-rings corresponding to like spacing of connector pins to which the former may be attached as a unit, said frangible means affording breaking away of said base upon relative movement between it and the C-rings.

4,043,453
HOLDER AND DISPLAY DEVICE FOR WRENCH SOCKETS
Hugh T. Greenlee, Gates Mills, Ohio, assignor to The Wright Tool & Forge Company, Barberton, Ohio
Filed May 11, 1976, Ser. No. 685,395
Int. Cl.[2] B65D *85/20, 73/00*
U.S. Cl. 206—349 **1 Claim**



1. In combination, an elongated flat cardboard strip folded along transverse fold lines to form three connected sides defining a triangular hanger loop with an aperture in one of said sides, a socket for a socket wrench tool and a fastening device for anchoring said socket to said triangular loop,

said socket having a rectangular recess at one end for receiving a socket wrench tool drive stud and a transverse detent hole in the sidewall of said recess, and

said fastening device having a head larger than said aperture and a male plug portion adapted to extend through said aperture inn said side of said loop and be snugly received in said recess, said male plug portion comprising a pair of

spaced parallel legs that define in transverse section, a rectangle corresponding to said rectangular recess in said socket, and including a resilient arm located between said legs and adjacent a wall of said recess between said legs with a transversely extending catch adapted to latch in said opening, said resilient arm being movable between a flexed position and an unflexed latching position,

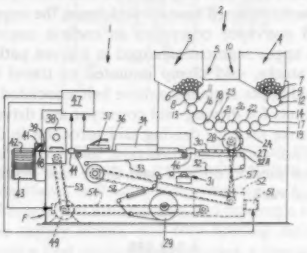
whereby when said male plug portion is moved through said aperture in said side of said loop from the inside out and inserted in said recess with said catch in alignment with said detent hole, said resilient arm is flexed until said catch enters said detent hole whereupon said resilient arm returns to its unflexed position to anchor said socket to said loop whereby said loop may be used to hang said socket for display.

4,043,454

METHOD AND APPARATUS FOR PRODUCING AND CONTROLLING THE PRODUCTION OF COMPOSITE FILTER PLUGS

Joachim Reuland, Neu Bornsen, Germany, assignor to Hauni-Werke Korber & Co. KG, Hamburg, Germany

Filed Oct. 31, 1975, Ser. No. 627,656
Claims priority, application Germany, Nov. 22, 1974, 2455271
Int. Cl.² B07C *5/344*
U.S. Cl. 209—81 R **26 Claims**



1. In an apparatus for producing and controlling the production of composite filter plugs for use in the manufacture of filter cigarettes or the like, a combination comprising means for assembling a continuous rod-like filler consisting of at least two types of alternating filter rod sections; means for conveying said filler along a predetermined path; means for draping said filler into a continuous web of wrapping material in a first portion of said path to form a continuous filter rod; means for severing said rod in a second portion of said path so that said rod yields discrete filter plugs each of which normally contains at least a portion of at least one section of each of said types; and control means including at least one capacitive detector having a plurality of electrodes adjacent to said path intermediate said assembling means and said severing means and means for establishing between said electrodes a high-frequency electric field which is at least partially traversed by successive sections in said path whereby the output of said detector transmits a series of signals in response to movement of successive sections past said electrodes, the signals of said series together constituting a continuous signal flow including a sequence of first signals of first intensity and a sequence of second signals of second intensity which said detector respectively transmits in response to movement of first and second types of sections past said electrodes, means for comparing the signals of said series with a reference signal, means for timing the occurrence of successive signals of one of said sequences, and means for producing additional signals in response to occurrence of successive signals of said one sequence.

4,043,455

BENEFICIATION OF FLUORSPAR ORE

Ernest R. Ground, Cd. M. Muzquiz, Coahuila, Mexico, assignor to International Minerals & Chemical Corporation, Libertyville, Ill.

Filed Oct. 20, 1976, Ser. No. 734,164
Int. Cl.² B03D *1/02*
U.S. Cl. 209—167 **8 Claims**

1. In a method for beneficiating a fluorspar concentrate, containing apatite as a gangue mineral, which includes further concentrating the fluorspar by a froth flotation process utilizing an acid flotation circuit, the improvement, which comprises

adding an apatite-collecting cationic reagent to the flotation circuit to collect and float substantially all of the apatite;

adding a source of fluoride ions to the flotation circuit to depress the fluorspar;

removing the floated apatite; and

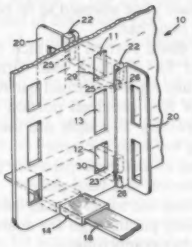
recovering the fluorspar from the underflow.

4,043,456

DIVIDERS AND PARTITIONS FOR SAME

James B. Howell, Woodcliff Lake, N.J., assignor to Advertising Displays Corporation, Englewood, N.J.

Filed Aug. 12, 1976, Ser. No. 713,903
Int. Cl.² B65D *7/24, 25/04*
U.S. Cl. 211—184 **1 Claim**



1. A straight wall substantially rectangular divider of uniform thickness for compartments, said divider comprising

a uniform series of upper and lower aligned openings along the major part of said divider,

at least one opening adjacent the base of said divider,

at least one strap for insertion at a 90° angle through said base opening for locking said divider to said strap and to permit stacking of goods against said divider and upon said strap to prevent removal of said divider from said compartment,

one or more partitions having means on one edge thereof for attaching said partition to said divider,

said attaching means on said partition comprising upper and lower projections,

said projections having extensions and a slot of about the thickness of said divider for passing said extensions through said upper and lower aligned openings in said divider and sliding said partition downwardly for attaching said partition to said divider,

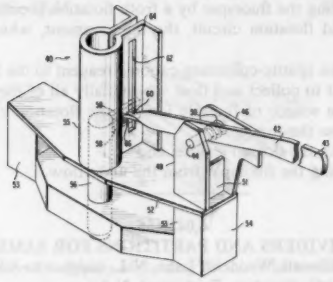
said partition having a right angle narrow extention at one longitudinal edge thereof from which said upper and lower extensions project,

said extentions being slightly offset from the opposite face of said narrow extension to accommodate said similar upper and lower extensions of another partition of the same construction when placed in opposite position against the said upper and lower extensions of said first partition so that both opposed partitions may be attached to said divider and virtually locked within the openings of said divider.

4,043,457
SAFETY MINE CAR COUPLING AND UNCOUPLING APPARATUS

Joseph Miller, General Delivery, Amherstdale, W. Va. 25607, and Clinton Cline, General Delivery, Chapmanville, W. Va. 25508

Filed Oct. 23, 1975, Ser. No. 625,112
Int. Cl.² B61G *1/00*
U.S. Cl. 213—75 B **6 Claims**



1. An apparatus for safely coupling and uncoupling mine cars which are coupled by insertion of a pin into coupling hitches of two adjacent cars comprising:

an apertured base plate adapted to be horizontally affixed to a hitch of a mine car;

a lever arm, a distal portion of which engages the coupling pin, adapted for inserting and withdrawing the pin to couple and uncouple a railroad car responsive to application of force to a proximal portion of said lever arm to permit an operator to couple and uncouple the cars without standing between the cars;

means attached to said base plate for pivotably supporting said lever arm on said base plate;

means for guiding the travel of said lever arm and the travel of the coupling pin through the aperture in the base plate and the hitches comprising:

a guide member attached to said base plate and formed with a slot for retaining the distal portion of said lever arm and defining a path of travel of said lever arm, said slot being knotched to provide a detent for the distal portion of said lever arm; and,

a channel means for guiding the coupling pin through its range of movement incident to insertion and withdrawal; and spring means for urging said lever arm into engagement with a portion of the perimeter of the slot of said guide member and for urging the lever arm into the detent, thereby tending to retain said lever arm in a fixed position along the path of travel of said lever arm.

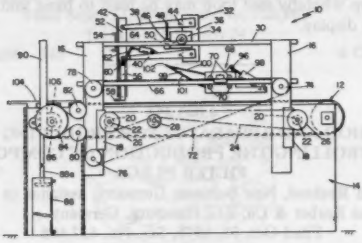
4,043,458
STACKER

Charles M. Schott, Jr., Gloucester, Mass., assignor to Gloucester Engineering Co., Inc., Gloucester, Mass.

Filed Mar. 2, 1976, Ser. No. 663,210
Int. Cl.² B65H *31/32*
U.S. Cl. 214—6 D **17 Claims**

1. A stacker for producing stacks of flat plastic bags and the like, said stacker being of the known type comprising an intermittently movable conveyor for receiving a series of forwardly projected bags, a fence positioned over said conveyor for stopping said bags so that they accumulate as a stack, means for raising the fence to allow forward movement of a completed stack and a clamp operable when the desired stack is formed for engaging the top of the stack, to press the stack downwardly against the conveyor, said conveyor and clamp thereupon movable together forwardly beneath the raised fence to advance the stack, that improvement comprising a receiver surface operative to lie over said conveyor and stack and extending to said fence when said fence is in raised position, said receiver surface adapted to receive bags thereupon while said clamp moves forwardly with the previously formed stack, said receiver surface movable forwardly beyond said fence whereby bags formed during forward motion of said clamp are released to fall by gravity upon said conveyor, and freeing said receiver surface to return above the next completed stack for repetition of the cycle.

17. In a bag stacker for plastic bags and the like having a fence for stopping forwardly projected bags so that they accumulate in a stack and raisable to permit completed stacks to

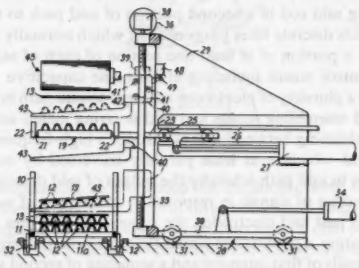


move forward, a movable conveyor passing beneath said fence, and a clamp for clamping completed stacks of bags against said conveyor and moving with said conveyor to draw completed stacks forward beneath said fence, the improvement wherein said conveyor comprises an endless conveyor belt including an upper segment arranged in a given path for conveying said stacks, said clamp mounted to travel in a path parallel to said upper segment, a drive belt associated with said clamp, sprockets for driving said conveyor and drive belts, an adjustable stroke rack for driving said sprockets in dependent motion in stack-conveying direction, and clutch means enabling reverse motion only of said drive belt driving return motion of said rack.

4,043,459
APPARATUS FOR LOADING STILLAGES

Alain Moreau, Morancez, France, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Aug. 31, 1976, Ser. No. 719,084
Claims priority, application United Kingdom, Sept. 3, 1975, 36346/75
Int. Cl.² B65G *57/18*
U.S. Cl. 214—6 DK **10 Claims**



1. Apparatus for loading a stillage, comprising a main frame, a plurality of forwardly projecting sub-frames which are mounted horizontally in line with each other on the main frame for forward and rearward movement relative to the main frame and which are spaced apart, one or more horizontal rollers carried by each sub-frame and mounted for rotation

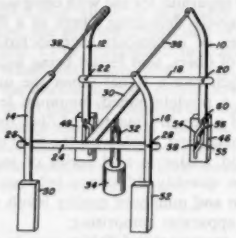
about respective horizontal axes extending at right angles to the direction in which the sub-frames are spaced apart, a plurality of forwardly projecting tines interspersed with the sub-frames in said direction so as to be capable of being moved vertically to levels above and below the sub-frames, the tines being mounted for vertical movement in unison relative to the frame to levels above and below the sub-frames and being movable forwardly and rearwardly.

4,043,460

TRAY STACKING AND UNSTACKING APPARATUS

Bruce B. Steele, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 9, 1976, Ser. No. 647,843
Int. Cl.[2] B65G *60/00*
U.S. Cl. 214—6 BA **6 Claims**



5. Tray stacking apparatus for use with supply means supplying a succession of trays to a receiving station in said tray stacking apparatus, said apparatus comprising:

tray holding means for engaging and holding a tray supplied by the supply means, said tray holding means movable between a first position for engaging a tray and a second position for disengaging a tray;

moving means for reciprocally moving said tray holding means;

guide means for guiding a part of said tray holding means and defining a first and a second path along which said part of said tray holding means is sequentially moved by said moving means, movement of said part along said first path in one direction causing said tray holding means to deposit a first tray held thereby on a second tray supplied by said supply means to the receiving station, and movement of said part along said second path in the opposite direction causing said tray holding means to engage the second tray and to raise the stacked first and second trays thus allowing a third tray to be supplied to the receiving station by said supply means;

said first and second paths comprise first and second channels respectively, and said guide means include selector means at the junctions of said first and second channels for ensuring said part of said tray holding means moves along said first and second channels in proper sequence; and

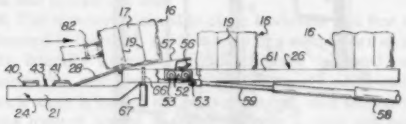
said selector means are movable between a first position for directing said part of said tray holding means along said first channel and then said second channel, and a second position for directing said part of said tray holding means along said second channel and then said first channel, thereby enabling said apparatus to be used as a tray stacking apparatus when said selector means occupy said first position and as a tray unstacking apparatus when said selector means occupy said second position.

4,043,461

STACK LOADER FOR BALES

Manuel A. Castro, P. O. Box 193, Banta, Calif. 95304

Continuation of Ser. No. 429,363, Dec. 28, 1973, abandoned.
This application July 24, 1975, Ser. No. 598,701
Int. Cl.[2] B65G *57/32*
U.S. Cl. 214—6 B **2 Claims**



1. A bale stacking machine comprising a ground-support frame, a first table extending transversely of said frame, a loader on a first side of said frame having first means for lifting bales from the ground and depositing said bales one at a time on said machine extending transversely of said frame, a second table on said frame rearward of said first table, second means for moving bales longitudinally rearward from said first table onto the forward end of said second table, said second means being operable to move said bales so that the same surfaces of said bales that rest on said first table rest on said second table, restraining means adjacent each forward corner of said second table selectively operable to hold the forward outer corners of a pair of first bales on said second table, as a subsequent second bale deposited on the middle of the forward edge of said second table turns said pair of first bales from a transverse direction toward a longitudinal direction, and longitudinal conveying means on said second table to move a pattern of four bales longitudinally rearwardly on said second table from said forward end to the rearward end of said second table, said second means depositing said bales on said second table rearward of the foremost position of said longitudinal conveying means, said longitudinal conveying means comprising a rod extending transversely of said second table having upstanding bale-engaging tines to push bales on said second table rearwardly, guide means guiding said rod for reciprocation on said second table, actuating means for actuating movement of said rod, said rod located rearward of said restraining means, said guide means comprising a roller mounted on each end of said rod, an inward-facing channel mounted on each longitudinal side of said second table below the level of said second table, said rollers sliding in said channels and guiding said rod for horizontal reciprocation parallel to the top surface of said second table.

4,043,462

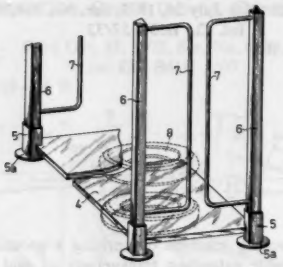
LOADING PLATE STRUCTURE ADAPTED TO BE STACKED

Dieter Schiron, Ahlem, Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

Filed Jan. 19, 1976, Ser. No. 650,074
Claims priority, application Germany, Jan. 17, 1975, 2501689
Int. Cl.[2] A47F *5/10*
U.S. Cl. 214—10.5 R **7 Claims**

1. A loading plate structure adapted with other loading plate structures of the same design to form a stack of pneumatic tires with the least possible work and complexity upon a prescribed loading surface, which includes in combination: a loading plate having at least two pairs of oppositely located sides, two pairs of corner posts, each of said pairs of posts having one post connected to each end of one pair of oppositely located sides, and two pairs of U-shaped yokes, each yoke having two arms joined together by connecting means at one end of each arm, the two arms of each yoke at their free ends being connected to one post but each yoke being connected to a different post, the arms of the yokes of each pair of posts extending in a direction toward each other with the connecting means being spaced from each other, each of said posts having a bottom and

a top section, the arms of each yoke being respectively connected to the bottom and top sections of the pertaining posts,



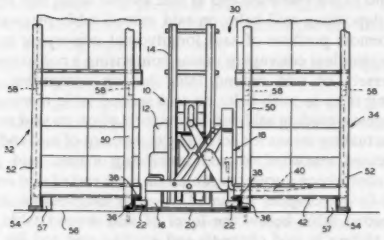
the yokes being respectively slidably detachably connected to the pertaining posts and non-rotatably secured thereto.

4,043,463

MATERIAL STORAGE FRAME SUPPORT AND VEHICLE GUIDE STRUCTURE

Howard C. Hansen, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed June 14, 1976, Ser. No. 695,666
Int. Cl.[2] B65G *1/06*
U.S. Cl. 214—16.4 A **3 Claims**



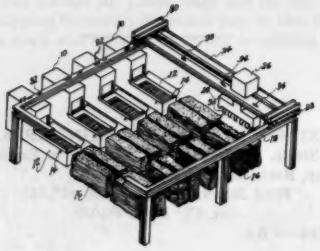
1. A material handling and storage system comprising a pair of material storage frames supported on the floor and forming an aisle therebetween, said storage frames forming a multiplicity of columns and rows of storage bins for material loads, the storage frame structure including a pair of confronting longitudinally extending continuous Z-rails forming guide tracks in said aisle adjacent the floor, each Z-rail having its lower horizontal flange secured to the floor and its upper horizontal flange extending towards the aisle and forming with the vertical web thereof a guide track, a plurality of longitudinally spaced vertical posts adjacent each side of said aisle forming a portion of said pair of storage frame structures, each post resting and being supported upon said lower horizontal flange of the adjacent Z-rail, the lower row of material loads being supported adjacent said aisle from the upper flange of the Z-rail, a substantial portion of the weight of the storage frame structure and material loads located in the bins above the first row of bins thereof being imposed upon the floor mounted flange of each Z-rail, and a substantial portion of the weight of the material loads stored in the lower rows of bins of each frame structure being imposed upon the continuous upper flange of the respective Z-rail and a wheeled vehicle operable in said aisle for depositing and retrieving material loads in said storage bins having front and rear pairs of side guide rollers constrained in the guide tracks formed by said Z-rails.

4,043,464

ANTI-CHOKE APPARATUS

Alex J. Keller, Gastonia; Joseph R. Williams, Kings Mountain, and James K. Mosteller, Mount Holly, all of N.C., assignors to Automatic Material Handling, Inc., Bessemer City, N.C.

Filed Aug. 20, 1976, Ser. No. 716,275
Int. Cl.[2] D01G *13/00*
U.S. Cl. 214—17 CA **10 Claims**



1. Anti-choke apparatus for use with equipment for automatically and selectively delivering fibers to a feeder unit in a preselected series of increments each including a predetermined quantity of fibers, said feeder being located adjacent a hopper which generate a signal when the quantity of fiber therein reaches a predetermined minimum level and which becomes choked when the quantity of fiber therein exceeds a predetermined maximum level, with the total quantity of fiber delivered to said feeder in said series of increments being greater than the quantity difference between said predetermined maximum and minimum quality levels of said hopper; said anti-choke apparatus comprising:

a. means for operating said feeder unit to cause the fiber therein to be fed to said hopper; and

b. control means for automatically energizing said feeder unit operating means after a predetermined number of said fiber increments have been delivered to said feeder unit, said predetermined number of said fiber increments being selected to assure that the total quantity of fiber delivered in said predetermined number of fiber increments is not greater than the difference between said predetermined maximum and minimum quantity levels of said hopper, and said control means acting to automatically de-energize said feeder unit operating means before any further fiber increments are delivered to said feeder unit.

4,043,465

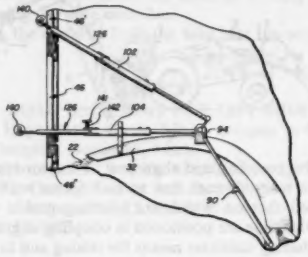
SILO DOOR CONSTRUCTION AND DISCHARGE CHUTE POSITIONING APPARATUS

James B. Rutten; Peter T. Rutten, both of Plainfield; Gordon G. Therrien, Oswego, and Richard S. Gaylord, Plainfield, all of Ill., assignors to Railoc Company, Inc., Plainfield, Ill.

Filed May 30, 1975, Ser. No. 582,135
Int. Cl.[2] B65G *65/38*
U.S. Cl. 214—17 DB **7 Claims**

1. In combination, a silo door system and automatic lowering silo unloader apparatus, said door system including a plurality of frame panel sections positioned in engagement with the interior wall of said silo in overlying relation to an elongate vertical opening or openings formed in the silo walls, each said frame panel section including an aperture bounded by upper, lower and side panel portions such that when in position, said upper and lower panel portions of adjacent frame sections cooperate to define a series of vertical cross frame portions and said unloader apparatus being of the type adapted to rest upon the top of the material in the silo and be lowered automatically in response to the discharge of silage, said unloader apparatus including a pivotal discharge chute which must be maintained in alignment with the apertures provided by said frame panel sections, and positioning means for said chute, said positioning

means comprising upper and lower, spaced apart arm members, mounted upon said discharge chute, said upper arm member being pivotally mounted relative to said chute and said lower arm member while the degree of movement between said lower arm member and said chute is limited, said upper and lower arm members each including an end portion for disposition through said panel section apertures, such that when so disposed they are adapted to rest upon the cross frame portions provided by said frame panel sections and serve to



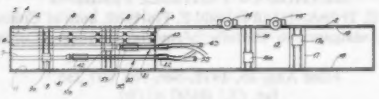
maintain the discharge chute in alignment with said panel section apertures, the pivoted connection of said upper arm, enabling said arm to be maintained in a discharge opening above that in which said lower arm is engaged, such as the unloader with the discharge chute moves downwardly, one of said arms will, at all times, be engaged in a discharge opening, thereby maintaining the chute in position, and precluding undesired rotation thereof, and roller means on the end portion of each said arm member to facilitate passage of said arm member from one aperture to the next.

4,043,466

DUAL TRACK TRANSFER SYSTEM AND A TRANSFER CAR FOR USE THEREWITH

Earl C. Vice, Ashland, Ky., assignor to Armco Steel Corporation, Middletown, Ohio

Filed Apr. 16, 1976, Ser. No. 677,711
Int. Cl.[2] F27B *3/18*
U.S. Cl. 214—18 SC **10 Claims**



1. A dual track transfer system for shifting a transfer car between first and second stations and for turning in a minimum amount of space said transfer car at said second station at least 90° to its direction of travel immediately prior to its turning, said system comprising a transfer car having a body, a lead truck and a following truck both pivotally mounted on said body, said lead and following trucks each having at least four standard flanged wheels, a first set of parallel railroad-type rails, said wheels of said lead truck being mounted on said first set of rails, a second set of parallel railroad-type rails, said wheels of said following truck being mounted on said second set of rails, said first and second sets of rails being parallel to each other and overlapped with the right hand rails of each set lying in close proximity to each other and the left hand rails of each set lying in close proximity to each other, at a point near said second station where said transfer car is to begin said at least 90° turn said first set of rails having a curved portion turning laterally away from said second set of rails with the outside rail of said curved portion crossing that one of said rails of said second set which lies between said rails of said first set, said second set of rails continuing from said point where said transfer car is to begin said turn without direction change whereby said lead truck will follow said curved portion of said first rail set and said following truck will continue on said second rail set until said transfer car has turned said at least 90°, said curved portion of said first track set being of such radius and length that the centerline of said lead truck will lie at an angle of less than 90° to said rails of said second set when said car body has turned said at least 90° and means for shifting said transfer car between said first and second stations along said first and second rail sets.

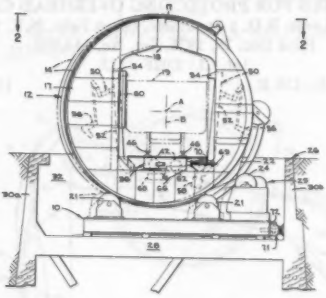
5. The structure claimed in claim **1** wherein said first station is located in the scrap yard building of a steel mill, a scrap box with laterally extending trunnions being mounted on said transfer car, said first station comprising a loading station at which scrap is loaded into said scrap box, said second station being located on the charging floor of a steel mill building containing at least one melting furnace, at least one overhead crane within said furnace building, said second station comprising an unloading station at which said trunnions of said scrap box are engaged by said crane and said scrap box is lifted from said transfer car by said crane and shifted to said furnace for the charging of said scrap into said furnace.

4,043,467

ROTARY CAR DUMPER WITH SHIFTABLE FRAME

Arthur S. Hand, Jr., North Wales, Pa., assignor to FMC Corporation, San Jose, Calif.

Filed Oct. 7, 1976, Ser. No. 730,413
Int. Cl.[2] B65G *67/34*
U.S. Cl. 214—52 C **6 Claims**



3. A car dumper to receive cars from and to discharge cars to an adjacent track, said dumper comprising in combination: a foundation, a base movably mounted in the foundation, a frame mounted on the base and invertible thereon about a longitudinal axis, said frame having an opening to pass cars therethrough, a carriage mounted in the frame and invertible therewith, said carriage movable laterally in the frame and having rails to receive cars from and to discharge cars to said adjacent tracks when the rails of the carriage are aligned with the adjacent tracks, means to shift the base on the foundation and thereby shift the opening in the frame laterally with respect to the adjacent tracks, a stop member mounted in the foundation to engage the carriage and to maintain the carriage stationary during said shift to maintain the rails on said carriage in alignment with the tracks.

4,043,468

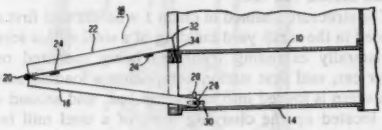
RETRACTABLE RAMP FOR LIFTING OBJECTS INTO A VEHICLE

Frank Joseph Shea, 258 E. Shore Trail, Sparta, N.J. 07871

Filed Apr. 2, 1976, Ser. No. 673,254
Int. Cl.[2] B65G *67/02*
U.S. Cl. 214—85 **6 Claims**

1. A ramp for lifting objects up onto the floor of a vehicle comprising

a frame slidably mounted below said floor,
an incline pivotally connected near the exterior end of said frame and being folded down upon said frame when not in use,
a pair of spaced guides mounted below said floor for guiding said frame,
said guides each having a hole located near to the exterior end thereof,



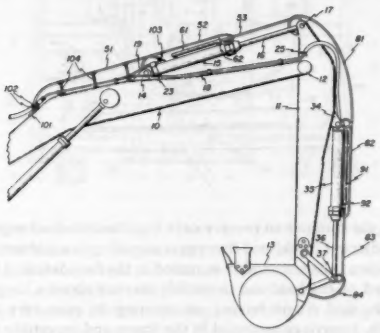
said frame having near its interior end a pair of spring-loaded pins which snap into said guide holes when said frame is slid from beneath said floor,
means on said frame for retracting said spring-loaded pins when said frame is to be moved out of said holes and
means located near the interior end of said incline for securing said incline to said floor when said frame is slid from beneath said floor and said incline is raised up onto said floor.

4,043,469

APPARATUS FOR PROTECTING OVERHEAD CABLES

Daniel D. Lewis, R.D. 1 Sunnyside, Glens Falls, N.Y. 12801

Filed Dec. 29, 1975, Ser. No. 644,503
Int. Cl.[2] E02F *3/32*
U.S. Cl. 214—138 R **11 Claims**



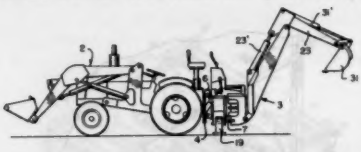
1. Apparatus for use in connection with material handling equipment having pivotably connected arm members and hydraulic members for moving said arm members, said hydraulic members having connection points on said arm members, said apparatus providing for protection of overhead cables from damage by said arm members and said hydraulic members, said apparatus comprising:
at least two smooth guard members, each said guard member having first and second ends;
means for attaching said first end of a first of said guard members to a first arm member;
means for attaching said first end of a second of said guard members to a second arm member; and means attached to one of said members slidably receiving at least one of said second ends for forming in co-operation with said guard members a substantially continuous bumper overlying said hydraulic means and at least a portion of said arm members.

4,043,470

HITCH FOR COUPLING ALIGNMENT OF TRACTOR AND BACKHOE

John S. Pilch, Ware, Mass., assignor to Ware Machine Service, Inc., Ware, Mass.

Filed June 1, 1976, Ser. No. 692,014
Int. Cl.[2] B66F *9/00*
U.S. Cl. 214—145 A **9 Claims**



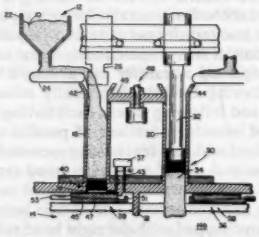
1. Hitch for coupling and alignment of tractor-type vehicle and backhoe wherein each has an end frame with coupling means carried thereon which are interengageable when the tractor and backhoe are positioned in coupling alignment, said backhoe including stabilizer means for raising and lowering its end frame, said hitch comprising guide means on one of said end frames and a guide member on the other of said end frames, said guide means including vertically inclined surfaces which extend laterally toward each other, each inclined surface terminating along an open edge disposed to engage said guide member in at least partially coextensive longitudinal relationship when said end frames are moved toward each other longitudinally for interengagement of their respective coupling means, said guide means and guide member being adapted when engaged along one of the open edges to provide a lateral component of force upon lowering by said stabilizers of the end frame of the backhoe from a raised position and lateral misalignment relative to the tractor, said component of force serving to move the coupling end frame of the backhoe laterally into coupling alignment with the tractor said coupling means includes means for supporting and pivotably interconnecting the end frame of the backhoe to the end frame of the tractor and being disposed to interengage upon said lowering of the end frame of the backhoe in coupling alignment.

4,043,471

METHOD OF PARTICLE FEEDING

Harold E. Trumbull, and Ronald F. Hartung, both of Columbus, Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Aug. 25, 1975, Ser. No. 607,336
Int. Cl.[2] B65G *65/30*
U.S. Cl. 214—152 **1 Claim**



1. A method of feeding a material comprising solid particles from a first region at a first pressure to a second region at a substantially different second pressure, comprising
conveying the material from the first region into an elongate tube connected to communicate between the first region and the second region, whereby the material can be moved through the tube in a column,
providing a movable sealing zone in the tube comprising an

annular layer around the periphery of the column, formed from a mixture of solid particles and an added liquid, contacting the inner wall of the tube,

providing a substantially fluid-tight seal between the second region and at least a substantial portion of the tube communicating with the first region while particles are being conveyed from the first region into the tube by closing a gate between the second region and the tube portion,

compressing the conveyed material while said gate is closed,

venting the tube while the material is being compressed,

opening the gate, and then

forcing the material from the tube into the second region.

4,043,472

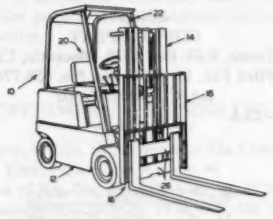
LOAD BACK REST FOR LIFT TRUCK

Deryl R. Hoyt, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Continuation-in-part of Ser. No. 636,501, Dec. 1, 1975, Pat. No. 3,995,891. This application Sept. 3, 1976, Ser. No. 720,285

Int. Cl.² B66F *9/14*

U.S. Cl. 214—750 **10 Claims**



1. In a lift truck having a load back rest connected to an elevatable fork carriage and extending in a generally vertical plane above the carriage, a back rest structure generally rectangular in configuration comprising a pair of vertically spaced multi-sided hollow structural members having inner sides confronting, a plurality of openings in one inner side spaced longitudinally thereof and substantially aligned with similar openings in the other inner side, a grille bar extending through each confronting pair of openings and into the interiors of both hollow structural members in such a manner as to provide a plurality of restrained beams when said beams deflect under load.

4,043,473

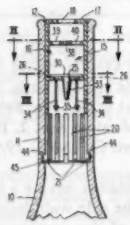
DEVICE TO PREVENT REFILLING OF BOTTLES AND THE LIKE

Norma M. Webb, 1532 Alison Drive, West Chester, Pa. 19380

Filed Jan. 3, 1977, Ser. No. 755,956

Int. Cl.² B65D *49/02*

U.S. Cl. 215—21 **14 Claims**



1. A device to prevent refilling of bottle-like liquid containers comprising

a. a hollow generally cylindrical body portion having axially spaced upper and lower ends;

b. a liquid discharge port adjacent the upper end of the body portion;

c. locking means adjacent the lower end of the body portion for retaining the device securely within a container;

d. a transverse valve seat disposed internally of the body portion intermediate the discharge port and the locking means, said valve seat having a liquid discharge opening therein;

e. a valve adapted to rest upon the valve seat when the container is not in use;

f. a nipple extending from the valve and adapted to engage within and close the opening in the valve seat; and

g. valve control means connecting the valve to the valve seat, said control means being operative to permit the valve to separate a selected distance from the valve seat, to disengage the valve nipple from the valve seat opening, during discharge of liquid from the container;

h. said valve control means comprising at least one elongated stem joined to the valve and extending slidably through the valve seat and having a protuberance formed adjacent its distal end.

4,043,474

CHILD RESISTANT CLOSURE FOR A CONTAINER

William F. McCord, Fanwood, N.J., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 585,020, June 9, 1975, abandoned, which is a continuation of Ser. No. 405,372, Oct. 11, 1973, abandoned. This application June 17, 1976, Ser. No. 697,289

Int. Cl.² B65D *85/56, 55/02;* A61J *1/00*

U.S. Cl. 215—211 **4 Claims**

1. A child resistant dispensing package comprising:

A. A substantially cylindrical container having planar end members;

B. A dispensing orifice defined in one of said end members by a substantially circular rim;

C. At least one recess defined on the inner periphery of said rim;

D. A resistantly flexible snap-fit closure removably retained in said orifice by engagement with said rim further comprising:

1. A substantially round planar member;

2. An annular ring disposed in a plane parallel to said planar member;

3. An annular wall connecting said planar member to said ring;

4. An annular flange defined on the outer periphery of said planar member and lying in the same plane as said planar member and being of a predetermined size to be larger than the internal diameter of said rim of said container;

5. At least one lug defined on said flange in a position to cooperate with said recess defined on said rim, said lug being larger than said recess;

6. Said closure requiring a pull-off force of about 15 pounds for removal from said orifice when said recess and lug are not in orientation,

whereby said flexible closure may be pressed into said orifice

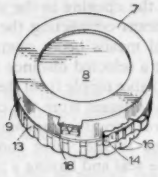
to close said container in any orientation, and a relatively small force is required to remove said closure when said lug and recess are oriented with each other.

4,043,475

CAPS AND CONTAINERS

Eric Charles Wheeler, Bexleyheath, England, assignor to Glyndon Plastics Limited, London, England

Filed Oct. 15, 1976, Ser. No. 732,896
Int. Cl.[2] B65D *55/02, 85/56;* **A61J** *1/00*
U.S. Cl. 215—223 **7 Claims**



1. A cap and container assembly comprising a container having a cylindrical neck portion on the outside of which are provided first and second annular beads, said first bead being nearer to the rim of said neck than said second bead and extending only partially around the circumference of said neck, there being an outwardly projecting lug on said neck, at the level of said first bead, substantially midway between the ends of said first bead, and a cap having a top wall portion and a depending skirt, said skirt having near the lower edge thereof an inwardly directed third bead designed to engage, when said cap is fitted onto the neck to close said container, under said first bead on said neck of said container and under said lug, said third bead having therein a circumferential gap equal in length to slightly more than the circumferential length of said lug, the shape in profile of said first bead, said lug and said third bead and the resilience of the material of at least the skirt of said cap being such that when said cap is forcibly applied to the neck of said container in any relative angular position said third bead will snap over said first bead and said lug to retain said cap in position on said container, the cap being thereafter removable only if it is first turned to an angular position in which said gap in said third bead is aligned with said lug, in which position the adjacent region of the cap can be flexed upwards sufficiently to allow said third bead to be disengaged progressively from said first bead, the lower edge of the skirt of said cap being furthermore joined by frangible web means to a circumferentially extending tear-off strip which is connected directly or indirectly to an inwardly directed circumferentially extending shoulder which, when said cap is first fitted to said container, engages under said second bead on the neck of the container to prevent removal of said cap, regardless of the angular position thereof in relation to said container, until said tear-off strip is at least partially detached.

4,043,476

LOCKING DEVICE FOR GOODS TRANSPORTING CARTS AND LIKE RECEPTACLES

Raymond Joseph, Schiltigheim, France, assignor to Ateliers Reunis Societe Anonyme, Schiltigheim, France

Filed Nov. 5, 1976, Ser. No. 739,342
Claims priority, application France, Mar. 1, 1976, 76.05745
Int. Cl.[2] B65D *7/20, 7/32;* **E05C** *5/02, 1/10*
U.S. Cl. 220—19 **6 Claims**

1. In a goods transporting and handling cart, receptacle or the like, comprising at least one movable lateral wall and a hingedly mounted folding shutter disposed in an aperture formed in said lateral wall, a locking device comprising a sliding bolt mounted on one side of said wall, a keeper carried by the adjacent wall and adapted to be engaged by said sliding bolt in one position thereof, wherein said sliding bolt, in an intermediate position thereof, is capable of locking said movable wall, said shutter and said bolt against movement, said locking device further comprising a member for controlling said sliding bolt and a resilient clamp adapted to be engaged by, and to retain said sliding bolt in said intermediate position, said

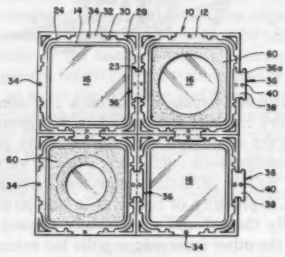
folding shutter further comprising a shoulder adapted to be engaged by the adjacent end of said sliding bolt in said intermediate position to preclude any untimely release of said shutter even in case said cart or like receptacle were turned upside down.

4,043,477

COIN DISPLAY

Raymond E. Deese, P.O. Box 1120, Placentia, Calif. 92670

Filed Feb. 17, 1976, Ser. No. 658,776
Int. Cl.[2] B65D *21/02*
U.S. Cl. 220—23.4 **13 Claims**



1. A display device comprising:

a base and cover which fit together to form a chamber for receiving the article to be displayed;

means on said base and cover formed on at least one edge of the device defining a recess;

interlocking means positioned in said recess for removably attaching the device to an adjacent, similar device so that a group of the devices may be readily joined to form a larger display assembly, said recess means being formed by both said base and said cover in a manner such that said interlocking means is initially positioned on said base in said recess and then captured in the recess when the cover is placed onto the base.

4,043,478

BEVERAGE CONTAINER WITH INTEGRAL STRAW

Richard D. Duncan, 1347 S. Meridian, Indianapolis, Ind. 46225

Continuation-in-part of Ser. No. 596,210, July 16, 1975, abandoned. This application Apr. 2, 1976, Ser. No. 673,198
Int. Cl.[2] A47G *19/22*
U.S. Cl. 220—90.2 **11 Claims**

1. In a beverage container having a side wall and a contiguous bottom wherein the side wall defines a passageway opening into the interior of the container near the bottom and extending to the top of the side wall, the improvement which comprises:

a generally tubular portion extending beyond the top of the

side wall defining an extension of the passageway, having a first position in which said portion extends outwardly from the top of the side wall of the container and having a second position in which the end of said portion furthest from the top of the side wall is adjacent the outside of the side wall; and

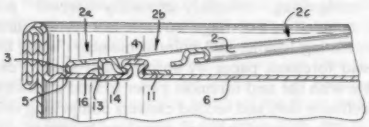
a lid portion having a first position in which it generally covers the top of the container when the tubular portion is in its first position and having a second position releasably attached to the outside of the side wall covering the end of the tubular portion when the tubular portion is in its second position.

4,043,479

FRONT OPENING EASY-OPENING END CLOSURE WITH VENT

Nick S. Khoury, Worth, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Continuation of Ser. No. 684,591, May 10, 1976, abandoned.
This application Oct. 21, 1976, Ser. No. 734,579
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—271 **8 Claims**



1. An improved easy-open end closure of the type comprising an end panel with a score line defining an opening flap therein, and a pull tab non-removably attached to said end panel and having rupturing means for rupturing said score line consequent to a predetermined displacement of said pull tab to open said closure, the improvement comprising: an auxiliary score line formed in said opening flap and rupturable to form a vent opening therein, and panelwardly directed auxiliary rupturing means on said pull tab for rupturing said auxiliary score line consequent to displacement of said pull tab to open said closure, said auxiliary score line being rupturable prior to rupture of said score line.

4,043,480

COVER WITH SPRING OPENED LID

Jerry Savoy, Lynnfield, Mass., assignor to Savoy Manufacturing Corporation, Haverhill, Mass.

Filed May 10, 1976, Ser. No. 684,903
Int. Cl.[2] B65D *43/16*
U.S. Cl. 220—334 **4 Claims**

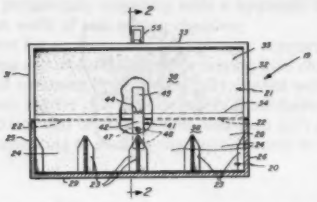
1. In combination:

a case of generally cubical configuration having a tray-like bottom with a top lid hingedly connected thereto;

releasable latch means on said bottom and lid, normally holding said lid in closed position on said bottom;

said tray-like bottom and top lid each having inside walls covered with a flexible fabric lining;

and a leaf spring, normally of S shape and independent of said hinge connection, said spring having a lower portion affixed to the inner wall of said bottom below, and an upper portion engaging the inner wall of said lid above,



said hinge connection, for automatically and resiliently raising said lid when said latch means is released.

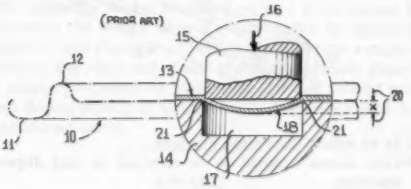
said leaf spring being underneath said lining and not visible.

4,043,481

SCORED METAL FLAP AREAS

Edward J. Herbst, Posen, Ill., assignor to Continental Can Company, Inc., Chicago, Ill.

Division of Ser. No. 596,502, July 16, 1975, Pat. No. 4,027,612.
This application Oct. 4, 1976, Ser. No. 729,463
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—266 **5 Claims**



1. A metal panel of a container end susceptible to blowout pressure, said metal panel comprising a flap area surrounded by an external region with an intermediate region therebetween, said flap area being curved in an inwardly convex manner, said intermediate region including a scored web of reduced thickness immediately adjacent to said external region and a stressed portion so disposed between said scored web and said flap area as to transmit stresses to said flap area, which stresses contribute to the inwardly convex curvature of said flap area, whereby said metal end wall is rendered less susceptible to blowout pressure.

4,043,482

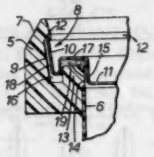
RE-USABLE CONTAINERS

Timothy John Brown, Wokingham, England, assignor to In. Da. Te. Aktiengesellschaft, Eschen, Liechtenstein

Filed Jan. 21, 1976, Ser. No. 651,016
Int. Cl.[2] B65D *39/00*
U.S. Cl. 220—307 **9 Claims**

1. In a combination of a re-usable container having an open-ended body with a mouth ring attached to an open end of the body and a closure, the improvement comprising: said ring being substantially thicker than the body wall of the container and the closure, a continuous internal surface of the mouth ring being shaped in a generally U-shaped configuration to receive and to lock in position an upstanding peripheral flange on said

closure for the open end of the container body, said closure and said ring having generally parallel sealing surfaces and a



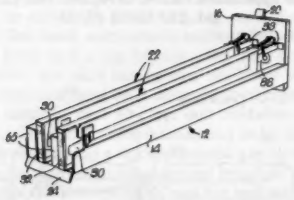
resilient seal disposed between said parallel sealing surfaces for compression therebetween.

4,043,483

DRAWER APPARATUS FOR ARTICLE DISPENSING MACHINE

LeRoy D. Gore, Independence, Mo.; William G. Gillett, Kansas City, Kans., and George F. Roberts, Independence, Mo., assignors to The Vendo Company, Overland Park, Kans.

Filed Sept. 7, 1976, Ser. No. 720,908
Int. Cl.[2] A47F *1/12*
U.S. Cl. 221—155 **8 Claims**



1. In an article dispensing machine:

drawer means adapted to be received in said dispensing machine;

cartridge means adapted to receive in an aligned successively abutting arrangement a plurality of articles to be dispensed,

said cartridge means including means for urging said articles therewithin toward one extremity thereof,

said cartridge means being provided with a pair of opposed lateral openings in upright sidewalls thereof and adjacent said one extremity thereof;

releasable means for removably securing said cartridge means upon said drawer means;

article displacing means including an article engaging element mounted on said drawer means for swinging movement from a standby position in which said element is disposed adjacent one of said lateral openings externally of said cartridge means to an operated position in which said element enters said cartridge means through said one lateral opening to engage one of said plurality of articles positioned between said opposed lateral openings and displace said article from said cartridge means through the other of said lateral openings for dispensing thereof.

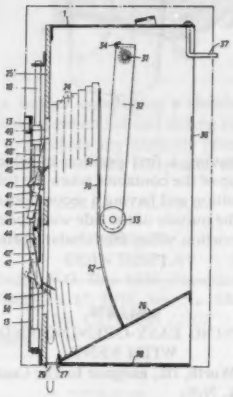
4,043,484

NEWSPAPER VENDING MACHINE

Benno Vanjo, Wehrweg 13 Klagenfurt, Kaernten, Austria

Filed Dec. 1, 1975, Ser. No. 636,421
Claims priority, application Austria, Dec. 3, 1974, 9671/74
Int. Cl.[2] G07F *11/16*; B65H *1/14*
U.S. Cl. 221—213 **5 Claims**

1. An automatic vending machine for papers having a receptacle for a stack of papers, said receptacle having a frontwall and a delivery slot, a delivery device arranged to remove a paper from the stack and feed it to the delivery slot, an operating handle for said delivery device, a rearwardly ascending slide track having an upstanding ledge at its forward edge, said delivery slot being defined between said front wall and said upstanding ledge, a pressure member for exerting forward pressure on a stack of papers placed on edge on the said slide track, said pressure member having an upper part whose pressure surface is parallel to the said front wall and a lower part whose pressure surface extends rearwardly and downwardly at an acute angle to said surface of said upper part, whereby the upper part of the foremost paper of the stack is pressed against the front wall while the lower part is pressed against the said



upstanding ledge, said delivery device having first carriers engageable with the said foremost paper of the stack to lift said foremost paper until its lower edge rises above the upstanding ledge and swings forward above the delivery slot, said first carriers comprising obliquely-upwardly-directed pointed members mounted on a carriage movable in a vertical direction by said operating handle, said pointed members being biassed toward said foremost paper by springs, and second carriers engageable with the said foremost paper to feed it downwards into the delivery slot, said second carriers comprising obliquely-downwardly-directed pointed members mounted on said carriage and biassed toward said foremost paper by springs.

4,043,485

MAGAZINE FOR A PLURALITY OF FIXTURES HOLDING INTEGRATED CIRCUIT CHIPS

Kenneth Boyd Tippetts, Glendale, Ariz., assignor to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed Aug. 9, 1976, Ser. No. 712,564
Int. Cl.[2] B65G *1/08*
U.S. Cl. 221—312 R **8 Claims**

1. A magazine for a plurality of fixtures, each fixture being adapted to hold a segment of a film strip having a lead frame attached to the segment and an integrated circuit chip bonded to the lead frame, the outer surfaces of each fixture substantially defining congruent rectangular parallelipipeds, the distance between the top and bottom faces of said parallelipipeds being the height of the fixtures and the top faces of the parallelipipeds being rectangular, said magazine comprising:

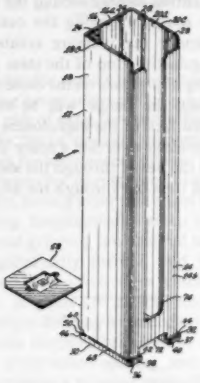
a hollow tube having a front wall, a back wall and a pair of side walls, each of said walls having a substantially planar inner face, each wall having a length and a width;

a pair of ribs formed on the inner faces of each wall of the tube, said ribs being substantially parallel to the intersections of the inner faces of the walls of the tube, said ribs being spaced apart and the cross section of the ribs being substantially a segment of a circle;

the cross sectional area of the space defined by planes substantially tangent to the surfaces of the ribs being slightly

greater than the area of the top face of a fixture so that a fixture loosely fits within said space;

a pair of rails having substantially planar and parallel upper and lower faces; the width of each rail being substantially less than one half of the width of the front wall and the length of each rail being greater than the length of a side wall; each of said rails having a front end and a back end; one of said rails being fixedly secured to one side wall and a portion of the back wall and the other of said rails being fixedly secured to the other side wall and another portion of the back wall so that the rails are substantially parallel to each other, so that they are uniformly spaced from each other, so that the back end of each rail projects beyond the back wall to form a pair of back ledges, and so that the front end of each rail extends beyond the inner surface of the front wall;



means forming an opening in the front wall, the minimum height of the opening measured from the upper faces of the rails being greater than the height of a fixture, the maximum height of the opening being less than twice the height of a fixture, and the width of the opening being substantially the complete width of the front wall;

means forming an opening in the back wall, the minimum height of the opening measured from the upper faces of the rails being at least a substantial portion of the height of a fixture and its width being substantially equal to the distance between the rails;

the front portion of the rails having means forming a step, the projecting portion of the step constituting front ledges; and

means forming a key slot in one of the front ledges.

4,043,486

MIXING APPARATUS

Jerry Dale Wisbey, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Feb. 2, 1976, Ser. No. 654,291
Int. Cl.[2] B67D 5/60
U.S. Cl. 222—134 **16 Claims**

1. Apparatus for mixing a plurality of liquids and discharging the resulting mixture into a mold runner or cavity downstream thereof comprising:

a housing having walls;

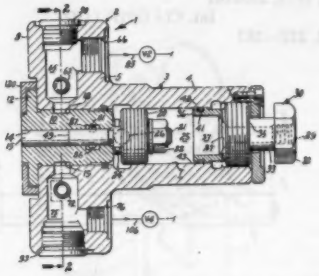
a mounting bore through said housing;

a sleeve secured in one end of said mounting bore providing a fluid-tight seal between first and second regions within and both at the same end of said mounting bore and having a mixing chamber bore defined therewithin, first and second ports communicating through said sleeve directly into said chamber, respectively, from said first and second regions;

first and second passageways, each for a fluid, through said housing walls into communication with said respective first and second regions;

an elongated plunger slidably fitted in said mixing chamber bore and peripherally engaging with a hydraulic fit the continuous walls of said mixing chamber;

a drive means for reciprocating said plunger supported on said housing and including therein a driving fluid chamber within said mounting bore substantially coaxial with said plunger axis, a drive piston reciprocably fitted therein and secured to one end of said plunger, and fluid port means for communicating to said driving fluid chamber to admit



and remove driving fluid to at least one face of said piston, said piston being disposed between said mixing chamber and the hereafter said stroke adjusting means the three of which are substantially coaxial with said plunger; and

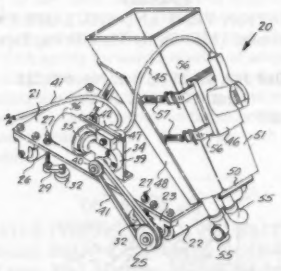
stroke adjusting means mounted on said drive means for adjusting the stroke of said piston hence to adjust the stroke of said plunger and being adjustable over a range to position the other end of said plunger sufficiently prior to a mixing procedure to block said first and second ports and during mixing at least partially to unblock said first and second ports.

4,043,487

MORTAR APPLYING MACHINE

Norris F. Price, Rte. 1, Surgoinsville, Tenn. 37873

Filed July 29, 1975, Ser. No. 600,071
Int. Cl.[2] B67D 5/64
U.S. Cl. 222—166 **4 Claims**



1. A mortar applying machine including a generally rectangular horizontal base plate, a pair of rollers extending transversely across said base plate at each end thereof supporting said base plate on the top of a masonry wall, means on said base plate for rotating one of said rollers to move said base plate along the masonry wall, guide roilers secured to opposite sides of said base plate for engaging the sides of the masonry wall to guide the base plate along the masonry wall, a hopper, a hinged tray for removably mounting said hopper on said base plate at one end thereof, hinge means connecting said tray to said base plate, at least one discharge opening in the bottom of said

hopper positioned at one end of said base plate, and means extending upwardly from said base plate to adjustably secure the end of said tray remote from said hinge means for adjustably positioning said hopper at an angle to said base plate.

4,043,488

BIN WITH DISCHARGE DEVICE

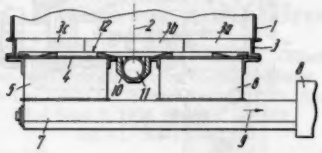
Tor Svein Halvorsen, and Oddmund Saxlund, both of Weinberg, Germany, assignors to Astrid Alice Saxlund nee Erichsen, Heidberg, Germany

Filed Nov. 7, 1974, Ser. No. 521,782

Claims priority, application Germany, Jan. 7, 1974, 2400547; Nov. 9, 1973, 2356161

Int. Cl.² G01F *13/00*

U.S. Cl. 222—233 **14 Claims**



1. A bin with a discharge worm device, especially for flour, shaving or chip-type goods, such as wood shavings, sawdust, wood-chips or the like, with a bin floor having at least one diameter and at least one discharge opening extending along the one diameter, a channel underneath the discharge opening containing the discharge worm device, and a drivable agitating discharge pusher above said bin floor drivable substantial distances in opposite directions in a horizontal plane characterized in that the agitating pusher comprises several rigid discharge rods being supported flatwise directly upon said bin floor and having a discharge face at one longitudinal side directed perpendicularly to said bin floor and a sloping face at the opposite longitudinal side extending backwardly and to the bin floor at an acute angle, and a reversing drive for driving the pusher alternately in opposite directions to such an extent that the agitating pusher on each stroke sweep generally along the total upper surface of the bin floor, the pusher comprising two groups of discharge rods with the discharge faces of different rods in each group being directed in opposite directions.

4,043,489

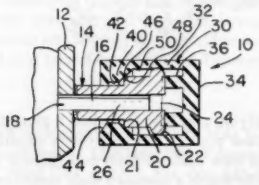
COMBINATION VENT AND SHUT OFF VALVE

Thomas P. Buckman, 11561 Shelly Vista Drive, Tujunga, Calif. 91042

Filed Jan. 15, 1976, Ser. No. 649,252

Int. Cl.² F16K *24/04*

U.S. Cl. 222—397 **3 Claims**



1. A combination vent and shut off valve adapted for use in conjunction with a vessel having pressurized fluid therein, said valve comprising a stem having a hollow cylindrical body portion with its inner end adapted for connection to an opening in the vessel whereby fluid communication is established between the inner portion of the pressure vessel and the hollow body portion of the stem, a stem head portion extending from the outer end of the stem body, said head portion having a hole extending therethrough in alignment with the hollow body, the head portion having an outer diameter greater than that of the hollow body so that a shoulder is formed where the stem body and stem head meet, the outer end of the head terminating in an annular guide member having a diameter greater than the head, said head having a fluid feed slot connecting the head hole with the outside of the head,

a cap assembled onto the stem for reciprocation thereon, said cap comprising a cylindrical hollow body sized to slidably fit over the stem head guide, said cap body having a closed end and an open end, a resilient annular flange extending from the inner face of the closed end of the cap body and resiliently engaging the top of the stem head guide, the open end of the body having an internal annular closure member fitting loosely around the stem body, the closure member snugly engaging the outer edge of the stem shoulder under the pressure created by the cap flange bearing against the top of the stem guide whereby upon the directing of pressure on the closed end of the cap toward the vessel, the flange will be compressed and allow the bevelled face of the cap closure to move away from the stem shoulder to create a space therebetween to allow flow from the vessel through the stem, out through the stem slot and then out through the aforesaid space.

4,043,490

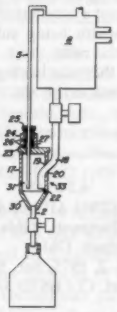
VOLUMETRIC FILLING SYSTEM APPARATUS

Harold D. McKinney, Rte. 4, Box 404, Pine Bluff, Ark. 71601

Filed Apr. 10, 1975, Ser. No. 567,047

Int. Cl.² G01F *11/28*

U.S. Cl. 222—442 **8 Claims**



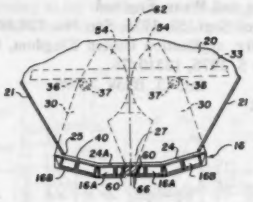
1. An apparatus component for controllably regulating substantially liquid material in prescribed quantities for dispensing comprising: a cylinder means with at least one side to receive said material, a material feed means extending into said cylinder means and sealingly affixed thereto; and a return vent means sealingly extending into said cylinder means for controllably regulating the said material; said feed means extends a greater depth into said cylinder means than said vent means and is an offset substantially S-shaped pipe extending within and through a side of said cylinder so that the usable volume of said cylinder is increased.

4,043,491

HOPPER BIN

Raymond A. Johnson, Grand Forks; John M. Lum, and Mike Kazakoff, both of Christina Lake, all of Canada, assignors to Interior Mill Equipment Ltd., British Columbia, Canada

Filed Sept. 7, 1976, Ser. No. 720,736
Int. Cl.[2] B65D *47/00*
U.S. Cl. 222—503 4 Claims



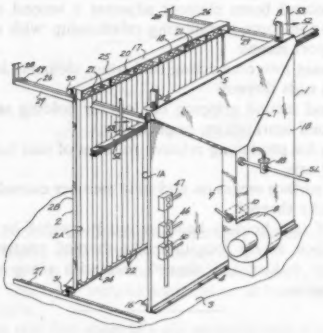
1. A hopper bin for particulate material comprising side and end walls having lower edges defining a discharge opening for the material, a pair of gates for controlling the flow of material through the discharge opening, mounting means supporting the pair of gates for movement between open and closed positions, power means for opening and closing the pair of gates, said pair of gates having inner side edges spaced apart to define a gap extending longitudinally when the pair of gates are closed, a material-gripping jaw secured to each inner side edge to extend longitudinally thereof, said jaws being vertically spaced apart and having free edges which overlap horizontally when the pair of gates are closed, said side and end walls having upper edges defining an infeed opening for the material, a screw conveyor mounted between the upper edges to extend longitudinally of the infeed opening, and drive means for rotating the screw conveyor to move material towards an end wall of the bin.

4,043,492

DRAPERY PRESSING APPARATUS

F. Grant Getchell, 510 Antelope Way, Eugene, Oreg. 97401

Filed Nov. 18, 1976, Ser. No. 736,748
Int. Cl.[2] A41H *43/00*
U.S. Cl. 223—30 14 Claims



1. An apparatus for pressing draperies and the like, said apparatus comprising,

upright structures each supporting a series of vertically disposed tubular pressing components, at least one of said structures adapted for movement toward and away from the remaining structure, said upright structures defining communicating ducts,

means supporting said one upright structure for opening and closing movement relative to the remaining structure,

motor means driving said one structure toward and away from the remaining structure, and

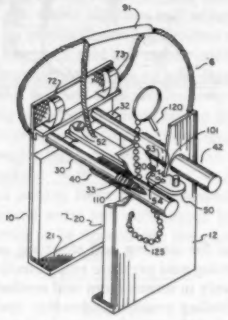
said series of tubular pressing components adapted to bias opposite surfaces of the drapery in a staggered manner to press same in serpentine folds.

4,043,493

SKI CARRYING DEVICE AND METHOD

Joseph Robert Camelio, 38 Ward St., Randolph, Mass. 02368

Filed June 1, 1976, Ser. No. 691,599
Int. Cl.[2] B65D *71/00*
U.S. Cl. 224—45 S 6 Claims



1. A ski-carrying device which comprises:

a. a pair of substantially parallel first and second plate elements, each element having an inward lateral extension at the one end, each extension adapted to support the side of a ski placed thereon;

b. a pair of substantially parallel rod elements extending inwardly from the other end of the plate elements;

c. a pair of substantially parallel tube elements extending inwardly from the opposite surface of the plate elements and over the respective rod elements;

d. tension biased means in the tube elements which bias the plate elements toward the open expandable position; and

e. the rod and tube elements positioned from the lateral extensions slightly above the width of the skis to be carried in the device.

f. a plate element characterized by an opening therein and which includes a locking element characterized by a plurality of saw teeth at the one end thereof and secured to and extending inwardly from the opposite plate element and through said opening in the said plate element, the saw teeth spring forward toward and adapted to engage in a locking manner the edge of the opening when the plate elements are in a closed carrying position and means to secure the locking element in the closed carrying position.

g. a handle means to carry the device with the skis secured therein.

4,043,494

APPARATUS FOR FEEDING A PLURALITY OF WIRES

David Edward Bickford, Harrisburg, Pa.; Robert Keith Southard, Largo, Fla.; Matthew Michael Sucheski, Harrisburg, and Earl William Wagner, Annville, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 660,565, Feb. 23, 1976, abandoned. This application Jan. 17, 1977, Ser. No. 760,219
Int. Cl.[2] B65H *51/10, 51/32*
U.S. Cl. 226—109 7 Claims

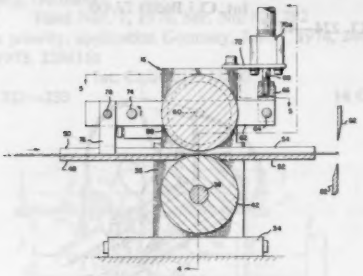
1. Wire feeding apparatus comprising:

a wire feed roll, said feed roll having a width which is sufficient to receive a plurality of wires in side-by-side parallel relationship, motor means for rotating said feed roll,

a plurality of pressure rolls, said pressure rolls being

mounted on axes which extend parallel to the axis of said feed roll, each of said pressure rolls having a non-feeding position, in which it is spaced from said feed roll, and being individually movable towards said feed roll to a wire feeding position,

wire guide means, said guide means being effective to guide wires from substantially endless source means towards said feed roll and position one wire between said feed roll and each of said pressure rolls and



control means for starting and stopping said motor means and for moving said pressure rolls selectively individually and selectively in unison from said nonfeeding positions to said wire feeding positions whereby, upon discriminative operation of said control means, said apparatus will produce groups of fed wires of varying predetermined lengths with the ends of each wire disposed at any desired location relative to the ends of the longest wire in the group.

4,043,495

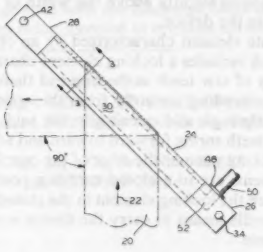
AIR CUSHIONED TURN BAR

Frank Sander, 4744 N. Kenneth, Chicago, Ill. 60630

Continuation of Ser. No. 554,635, March 3, 1975. This application Aug. 24, 1976, Ser. No. 717,178

Int. Cl.[2] B65H *23/32*

U.S. Cl. 226—197 **4 Claims**



1. A member for supporting and changing the direction of a continuously moving sheet of web material through a predetermined angle, comprising:

a hollow cylindrical bar over which said web material passes having a longitudinal axis;

a plurality of apertures having circular cross-sections disposed along said longitudinal axis of said bar;

said apertures extending between said hollow portion of said cylindrical bar and the exterior surface of said bar;

each said aperture including walls forming a continuously diverging curved surface extending in the direction from said hollow portion of said cylindrical bar to said exterior surface of said bar, the intersection of said walls and said exterior surface of said bar being smoothly curved with the exterior surface of the cylindrical bar to produce a laminar flow of fluid substantially coincident with the exterior surface of the cylindrical bar through approximately 180° of said exterior surface, thereby forming a fluid cushion for said sheet of web material.

4,043,496

FRICTION WELDING MACHINE

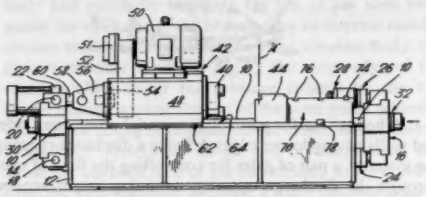
Emyr Jones, Bridgenorth, England, assignor to Clarke Chapman Limited, Tyne and Wear, England

Filed Sept. 30, 1976, Ser. No. 728,490

Claims priority, application United Kingdom, Oct. 10, 1975, 41536/75; May 5, 1976, 18310/76

Int. Cl. B23k *27/00*

U.S. Cl. 228—2 **12 Claims**



1. A friction welding machine of the kind in which first and second workpieces are relatively rotated about an axis of rotation comprising:

pressure-applying means operable to force said workpieces against one another to impose on one another load acting along said axis;

said pressure-applying means comprising first and second components relatively movable in the direction of said axis;

said first component of said pressure-applying means and a further support means providing reaction forces for said first and second workpieces respectively;

a strut member;

first and second beam elements;

each beam element adjacent a first end thereof being in force-transferring relationship with a respective end of said strut members;

said first beam element adjacent a second end thereof being in force-transferring relationship with said second component of said pressure-applying means;

said second beam element adjacent a second end thereof being in force-transferring relationship with said further support means;

tie means interconnecting said beam elements intermediate said ends thereof;

first and second gripping holders for holding said first and second workpieces, respectively;

means for producing relative rotation of said holders about said axis;

guide surface means on said strut member extending longitudinally thereof;

one of said holders being movably guided by said guide surface means longitudinally thereof relatively to said other holder and aligned therewith along said axis of rotation.

4,043,497

FRICTION WELDING MACHINE

Emyr Jones, Bridgenorth, England, assignor to Clarke Chapman Limited, England

Filed Sept. 30, 1976, Ser. No. 728,492

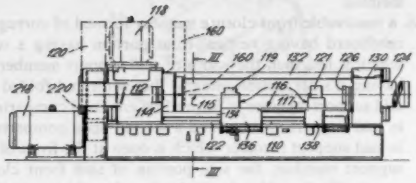
Claims priority, application United Kingdom, Nov. 12, 1975, 46790/75

Int. Cl.[2] B23K *27/00*

U.S. Cl. 228—2 **10 Claims**

1. A friction welding machine comprising a support, two

assemblies mounted on the support comprising respectively a first holder means and a second holder means, said first holder means being rotatable about a rotational axis, said first and second holder means being aligned on said rotational axis, means for relatively moving said assemblies along said support in the direction of said rotational axis, said assemblies together, in a relatively closest position, determining a finished weld zone there-between, a drive motor and drive means coupling said drive motor to said first holder means, flash removal means comprising shear tool means, mounting means movably supporting said shear tool means, and mechanism operable to



move said shear tool means into and out of a position in which said shear tool means are interposed between one of said assemblies and said finished weld zone axially with said rotational axis, said shear tool means having a width in a direction parallel to said rotational axis such that said shear tool means are movable into said position only after relative separating movement of said assemblies from said relatively closest position to relatively separate said finished weld zone from said one of said assemblies and said width being such that subsequent relative approach movement of said assemblies causes a relative traverse between said finished weld zone and said shear tool means.

4,043,498

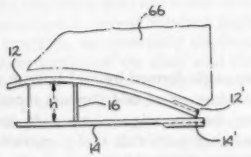
METHOD OF PLASTIC FLOW DIFFUSION BONDING

Charles E. Conn, Jr., Santa Ana, Calif., assignor to TRE Corporation, Beverly Hills, Calif.

Continuation-in-part of Ser. No. 441,441, Feb. 11, 1974, Pat. No. 3,950,841, and a continuation-in-part of Ser. No. 357,359, May 4, 1973, Pat. No. 3,936,920. This application Sept. 15, 1975, Ser. No. 613,223

Int. Cl.[2] B23K *19/00*

U.S. Cl. 228—265 **14 Claims**



1. A method for fabricating an internally stiffened, aerodynamically shaped shell structure comprising the steps of:

a. providing first and second metallic face sheets having an excess volume of metallic material on at least one of said face sheets;

b. Placing said first sheet in a die assembly which is configured to produce the desired basic aerodynamic shaped structure, said first face sheet having means to align said first face sheet in said die assembly;

c. placing at least one self-stable internal stiffener fabricated from metallic material upon said first face sheet, sand internal stiffener having a sufficient thickness to provide an adequate bonding area for joining the stiffener to the face sheets, a configuration which allows said self-stable member to provide sufficient support during the subsequent joining of said self-stable member to said face sheets, first and second ends which are received in said die assembly, and a height dimension which is greater than the net height requirement by approximately 0.01 to 0.08 inches to provide sufficient excess volume of said metallic material so as to provide positive fill in said die assembly for the desired amount of plastic flow of such material, and aligning said stiffener with respect to said first face sheet;

d. placing said second face sheet in said die assembly over said internal stiffener, said second face sheet having means to align said second face sheet in said die;

e. applying a forming an joining force to said internally stiffened structure for a sufficient duration at sufficient elevated temperature to cause intimate contact between opposed longitudinal edges of said face sheets and between said self-stable stiffener and adjacent areas of said face sheets by plastic flowing the excess volumes of material in the height of said self-stable internal stiffener and along the longitudinal edges of said face sheets, so as to join and bond said self-stable stiffener by solid state diffusion bonding to said face sheets and to join and bond said opposed longitudinal edges by homogeneous solid state diffusion bonding, thereby producing an aerodynamically shaped structure with leading and trailing edges, said forming and joining force being substantially localized in the to-be-joined areas and determined by the amount of excess material to be flowed and the plastic flow characteristics of the metal used.

4,043,499

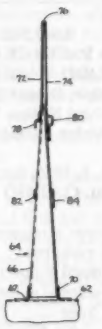
METHOD OF MAKING HELICAL ASSEMBLY

Joseph Dix, Williston; Norman Campbell, and Ivar S. Tonseth, Jr., both of Burlington, all of Vt., assignors to General Electric Company, Burlington, Vt.

Division of Ser. No. 535,834, Dec. 23, 1974, Pat. No. 4,004,490, which is a continuation of Ser. No. 352,007, April 17, 1973, abandoned. This application Sept. 3, 1976, Ser. No. 720,325

Int. Cl.[2] B21D *11/06*

U.S. Cl. 228—173 D **4 Claims**



1. A process of making a helical assembly comprising:

folding a first continuous ribbon of stock material into a folded plate structure having a repeated cycle of four flat, substantially triangular plates, two extending substantially transversely and two extending substantially longitudinally, each plate bent with a substantially sharp fold from the next adjacent plate, to form a multiturn helical fin of substantially truncated isosceles triangular cross;

progressively disposing and fastening said fin in a multiturn helical spiral around and to a central cylinder; and

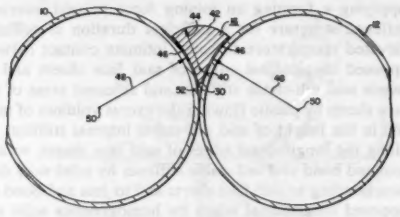
progressively rolling a second continuous ribbon of stock material into a multiturn helical spiral, and progressively coaxially interleaving said spiral with said fin and fastening said spiral to the first of the transversely extending plates in each cycle along an area intermediate the cylinder-distal and cylinder-distal ends of said first plate.

4,043,500

TUBE TO TUBE BRAZING

Thomas R. Padden, Greensburg; William J. Miller, Jr., Irwin, and Rockne L. Laubham, Trafford, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 7, 1976, Ser. No. 674,514
Int. Cl.[2] B23K *1/04*
U.S. Cl. 228—175 **12 Claims**



1. A method of joining metals comprising:

abutting a first curved metal member to a second curved metal member, the curvature of said metal members forming a gap along the interface of said metal members;

placing in said gap an insert having surfaces complementary to surfaces of said metal members;

spacing said insert from the metal members a distance sufficiently small to establish a capillary space therebetween;

bonding said insert to said metal members at intervals along the metal members' length thus maintaining the capillary space;

applying braze metal compatible with said insert and said metal members to said insert and said metal members;

heating said braze metal causing said braze metal to flow into said capillary space; and

cooling said braze metal below the solidus temperature of said braze metal to thereby bond the insert and metal members into a strong cohesive assembly.

4,043,501

PORTABLE LIQUID PACKAGE CONTAINER FOR USE WITH BLOOD WASHING DEVICE

Edward Whittum Larrabee, Bronxville, N.Y.; Paul Olney Rawson, Easton, and Richard Hajime Yagami, Westport, both of Conn., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,605
Int. Cl.[2] B65D *5/40*
U.S. Cl. 229—14 BE **1 Claim**

1. A portable container arrangement for use with a blood washing device which comprises

i. an orthoganally shaped support member formed of corrugated cardboard enclosed at the top, bottom and sides and being open at the front

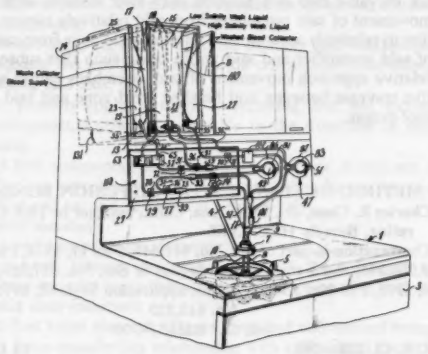
ii. a top extension member formed of corrugated cardboard being integral with the top of said support member at its open front and being folded back into said support member to fit tightly therein in a position parallel to the top of said support member, said top extension member having a slit like aperture located at a predetermined distance from the open front of said support member

iii. a first side extension member formed of corrugated cardboard being integral with a first side of said support member at its open front and being folded back into said support member to fit tightly therein in a position parallel to said first side of said support member, said first side extension member having a slit like aperature located at a predetermined distance from the open front of said support member

iv. a second side extension member formed of corrugated cardboard being integral with a second side of said support member at its open front and being folded back into said support member to fit tightly therein in a position parallel to said second side of said support member

v. a bottom extension member formed of corrugated cardboard being integral with the bottom of said support member at its open front and being folded back into said support member to fit tightly therein, said bottom extension member having a folded down end portion and a folded down side portion in contact with the bottom of said support member such that bottom extension member forms a small acute angle with the bottom of said support member

vi. a removable front closure member formed of corrugated cardboard having vertical front portion having a width which is less than the width of said support member and having a side portion integral therewith and folded into said support member to form a first enclosed compartment in said support member and a second open compartment in said support member which is open at the front of said support member, the side portion of said front closure member having a depth which is less than the depth of said support member and having a bottom edge slanted at said small acute angle formed by said bottom extension member and the bottom of said support member and having folded over integral edge members in contact with said support member such that said removable front closure member fits snugly in said support member and is recessed therein at a predetermined distance, the vertical front portion of said front closure member having integral tabs which engage said slit-like apertures in said top extension member and said side extension member of said support member.



vii. a pair of removable vertical partitions supported along their lower edges by said bottom extension member and loosely and moveably fitted in said first enclosed compartment in said support member and arranged to form three vertically extending sections in said enclosed compartment

viii. a first collapsible empty fluid container for collecting waste liquid in one of said three sections

ix. a pair of collapsible saline solution containers in each of the other of said three sections

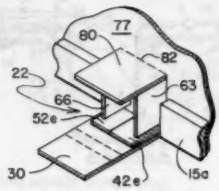
x. and a second collapsible empty fluid container in said open compartment in said support member

4,043,502

PACKING, SHIPPING, AND SIDE-DISPENSING CONTAINER FOR DENSE MATERIAL

Thomas E. Croley, Worthington, Ohio, assignor to Corco, Inc., Worthington, Ohio

Filed Aug. 30, 1976, Ser. No. 718,582
Int. Cl.[2] B65D *5/72, 5/48*
U.S. Cl. 229—17 B **4 Claims**



1. A container assembly of fiberboard or the like comprising a bottom tray of angular form having a flat bottom wall with an upstanding peripheral flange composed of a number of sides angularly disposed relatively, an upright material-receiving shell disposed within the flange of the tray and having upright side walls disposed inwardly of and adjacent to the sides of the flange, each of said sides of the tray flange being in the form of a double hinged flange consisting of an outer upright section hinged to the flat bottom and an inward depending insert section hinged to the outer section at a double hinge; each of said upright side walls of the shell adjacent the respective sides of the tray flange having a lower flange interlocking with the double hinged flange of the tray and consisting of a lower connector section hinged to the wall and extending outwardly and an upright insert section hinged to the connector section and extending upwardly between the outer upright section of the double hinged tray flange and its inner depending insert section; said interlocking double hinged flange of the tray and flange of the shell at one of said tray flange sides having cooperating outwardly-displaceable tabs to provide a dispensing passageway, when desired, which leads laterally through the tray flange and which comprises:

a tab structure of selected width hinged to the upright wall of the shell for outward displacement and located above said connector section of the wall flange, a tab formed in said inner depending insert section and outer upright section and double hinge of the side of the tray flange and being of no less width than the width of said shell upright wall tab structure to permit outward displacement of said wall tab structure, an outwardly displaceable tab in said upright inner section of the shell wall flange interlocked within the tab of the double hinged tray flange side and being of no greater width than that tab so as not to prevent outward displacement thereof but being of no less width than the shell upright wall tab to permit outward displacement of that tab; outward displacement of the tabs of the shell flange and interlocking tray flange causing outward extension of the tray tab with its double hinged flange horizontal and the tab of the upright insert section of the shell flange into horizontal position overlying it with the shell upright wall tab structure opening over the said overlying flanges; and securing means cooperating with said tray flange tab to maintain it in normal position,

and in which an outer shell is provided which surrounds the inner shell that serves as a liner shell, said outer shell having upright side walls with their lower ends disposed within the corresponding sides of the tray flange outwardly of the corresponding side walls of the liner shell and resting on said connector section of the liner shell lower flange:

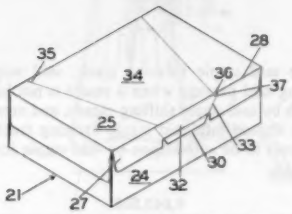
and an outwardly displaceable tab in the lower end of the outer shell side wall which is located within the side of the tray flange having the outwardly displaceable tab, said outer shell tab being hinged to the outer shell for outward movement and being of no less width than the tab structure of the upright liner shell wall to permit outward displacement of that tab structure and no greater width than the tab of the interlocking tray flange and shell flange to permit outward displacement of the outer shell tab through the opening provided by displacement of the tabs of the interlocking flanges.

4,043,503

RECLOSABLE CARTON

George Leroy Meyers, Menasha, and David Charles Mueller, Neenah, both of Wis., assignors to American Can Company, Greenwich, Conn.

Filed July 14, 1976, Ser. No. 705,341
Int. Cl.[2] B65D *5/56;* B56D *17/00*
U.S. Cl. 206—613 **6 Claims**



1. A paperboard carton blank having an inside and an outside surface, said blank comprising:

a. hingedly connected bottom, top, front, back, and end panels,

b. a front glue flap having a top edge and a bottom edge, said glue flap being hingedly connected along its top edge to the front of said top panel along a fold line and being adapted to be glued to the outside of said front panel,

c. a first pair of laterally spaced cut score lines forming a front cover portion in said front glue flap and extending substantially from the bottom edge of said glue flap upwardly and outwardly to said fold line.

d. a second pair of laterally spaced cut score lines forming a top cover portion in said top panel and extending substantially from said fold line rearwardly toward the back of said top panel, said second pair of cut score lines being spaced laterally inward of said first pair of cut score lines at said fold line, and

e. a third pair of cut score lines formed in the outside surface of said blank along said fold line extending between the cut score lines of said first and second pairs of cut score lines to form a pair of arrow locking tabs on the sides of the front cover portion at the top edge of the glue flap, the arrow locking tabs of said front cover portion being adapted to be inserted inside of said front panel and under said top panel to lock said top cover portion closed when the carton formed from said carton blank is reclosed.

4,043,504

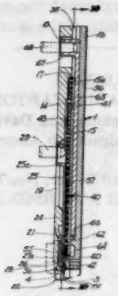
STAPLE CARTRIDGE AND FEED MEANS FOR USE WITH A SURGICAL STAPLING INSTRUMENT

J. Charles Hueil, Loveland, Ohio, and Robert G. Rothfuss, Bellevue, Ky., assignors to Senco Products, Inc., Cincinnati, Ohio

Filed Mar. 9, 1976, Ser. No. 665,294
Int. Cl.[2] B25C *5/02*
U.S. Cl. 227—116 **17 Claims**

1. A staple cartridge for use with a stapling instrument, said cartridge comprising a body having therein a staple forming track with a reciprocable staple former therein actuable by said instrument, a separate and distinct parallel staple feeding track for a stack of staples, a passage between said staple feeding and

forming tracks so sized as to permit the passage therethrough of one staple at a time from said staple feeding track to said staple forming track, means actuable by said instrument to shift one staple at a time from said staple feeding track through said



passage into said staple forming track, said staple shifting means closing said passage when a staple is not being shifted therethrough by said staple shifting means, and means to maintain a staple shifted into said staple forming track in proper position therein to be acted upon by said staple former.

4,043,505

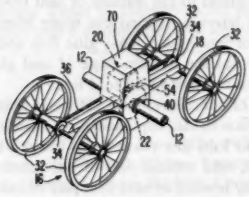
METHOD AND APPARATUS FOR REVERSIBLY POWERING A MOBILE IRRIGATION SYSTEM

Roger M. Sherman, Los Altos, Calif., assignor to MAC Corporation, San Jose, Calif.

Continuation of Ser. No. 544,208, Jan. 27, 1975, abandoned. This application May 27, 1976, Ser. No. 690,414

Int. Cl.[2] B05B *3/18*

U.S. Cl. 239—11 **6 Claims**



1. An improved, mobile irrigating system of the type having a plurality of wheel mounted irrigating pipes coupled in line to a central, motorized power unit which turns the irrigating pipe wheels by turning the line of coupled pipes wherein the improvement comprises a reversible, internal combustion engine for operating the central, motorized power unit, the engine having a shaft which rotates in either of two directions depending upon the direction of rotation used to start the engine, reversible electric starter means for selectively rotating the engine shaft in one of the two directions to start the engine, and means for remotely controlling the starter means from one end of the line of pipes.

4,043,506

INJECTION LINE SYSTEM

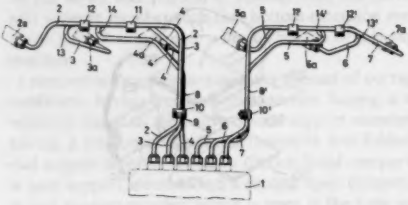
Jurgen Guido, Borsigstrasse 4, and Robert Stock, Dresdener Strasse 1, both of 8402 Neutraubling, Germany

Filed June 28, 1976, Ser. No. 700,471

Int. Cl.[2] B05B *15/00*

U.S. Cl. 239—76 **2 Claims**

1. An injection line system for linking an injection pump with a series of associated injection nozzles and comprising a plurality of injection lines of the same cross-section and length for mounting to extend between respective connection points of said injection pump and said injection nozzles, means for bundling said injection lines together at predetermined points to suppress operational vibration movements in said lines with the formation of compensation bends in the injection lines leading to said injection nozzles, coupling means for retaining portions of two or more of said injection lines in the region of their associated injection nozzles in side-by-side relationship



and in a first flow direction parallel to an imaginary line joining the connection points of said associated injection nozzles, at least another one of said injection lines being provided with a bent portion to define a section thereof extending in a second flow direction to its associated nozzle and opposite to said first flow direction, said section being in mutual overlap with respect to said injection lines disposed in side-by-side relationship and being coupled thereto by said coupling means.

4,043,507

APPARATUS FOR THE FORMATION OF LIQUID DROPLETS

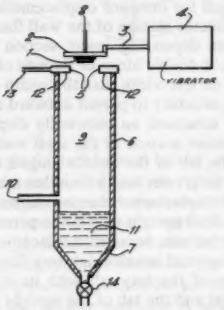
Peter Frederick Wace, Oxford, England, assignor to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 246,662, April 24, 1972, abandoned. This application Nov. 1, 1974, Ser. No. 520,091

Claims priority, application United Kingdom, May 5, 1971, 13373/71

Int. Cl.[2] G01D *15/18*

U.S. Cl. 239—102 **12 Claims**



1. Apparatus for the formation of liquid droplets comprising:

ejection means for ejecting downwardly a plurality of continuously moving jets of liquid, said ejection means comprising a lightweight dropping head in the form of a spinnerette having a plurality of orifices of highly uniform and accurate orifice size and position,

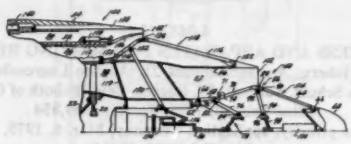
and break-up means for breaking up the continuously moving jets leaving the orifices, into short lengths which then form into droplets subsequent to their formation into short lengths, said break-up means comprising a means for vibrating the spinnerette as the said continuously moving liquid jets are issuing therefrom.

4,043,508

ARTICULATED PLUG NOZZLE

Donald W. Speir, and Donald P. McHugh, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 1, 1975, Ser. No. 636,572
Int. Cl.[2] B64C *15/02;* B64D *33/04*
U.S. Cl. 239—265.19 7 Claims



1. A propulsion nozzle comprising:

a nozzle shroud, and

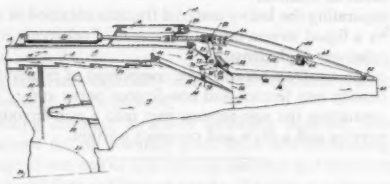
an articulated plug mounted in spacial relationship, and cooperating, with said shroud to form a fluid flow path therebetween having a throat and an exit, and wherein said plug comprises first, second and third flap means serially connected by means of articulated joints which are positionable with respect to said shroud to permit the throat of the nozzle to be displaced axially and the throat-to-exit area ratio to be modulated without translating said shroud or said plug.

4,043,509

ACTUATION SYSTEM FOR A GAS TURBINE ENGINE EXHAUST DEVICE

Donald P. McHugh, Wyoming, and Donald F. Cook, Goshen, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed May 13, 1976, Ser. No. 686,062
Int. Cl.[2] F02C *3/06;* F02K *1/12*
U.S. Cl. 239—265.41 8 Claims



1. In a gas turbine engine exhaust device including a first duct terminating in first variable position flap means defining a first throat; and a second duct exterior of the first duct terminating in second variable position flap means, the first and second flap means cooperating to define a second throat therebetween; the improvement comprising an actuation system characterized by:

a bell crank, having first and second arms, pivotably connected to the second flap means;

link means operatively connecting the first of said arms and the first flap means; and

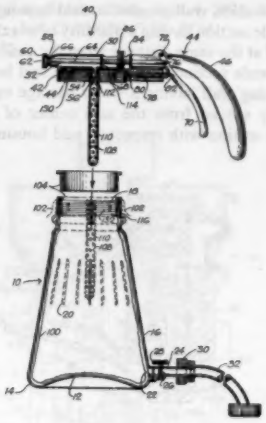
means operatively connected to the second of said arms for positioning said second flap means and for pivoting said bell crank to simultaneously position said first flap means.

4,043,510

NON-AEROSOL TYPE DISPENSER

William E. Morris, 1831 N. Douglas, Appleton, Wis. 54911

Filed Nov. 21, 1975, Ser. No. 633,971
Int. Cl.[2] B05B *11/02*
U.S. Cl. 239—323 2 Claims



1. A portable, hand operated dispenser for spraying fluid composition under pressure comprising a container having an open mouth at the top and an inlet in the body portion below the top, means connecting the inlet with a source of high pressure fluid, a flexible, fluid impervious bag adapted to be filled with the fluid material to be dispensed and to be received within the container with an open upper end portion of the bag draped over and about the wall defining the open upper end of the container, a spray head including a cap portion, a spray portion and a handle portion, said cap portion having means for removably securing the spray head onto the open upper end of the container in sealing relation therewith and with the portion of the bag in between, said spray portion including a tubular section having a nozzle opening at one end and an inlet in communication with the interior of the container when the spray head is in the assembled relation on the container, a needle valve mounted in the tubular section for reciprocal movement in the direction towards and away from the nozzle to plug the nozzle opening when in closed position and to free the opening when in open position, and means for actuating the needle valve between open and closed positions, said handle portion being located immediately rearwardly of the nozzle and cap portions in which the cap portion is formed with an open ended downwardly extending cylindrical skirt and in which the means removably securing the cap portion onto the container comprises screw threads in the skirt and screw threads in the outer wall of the container adjacent the upper end to enable the cap portion to be screwed onto and off of the container, and in which the lowermost screw thread in the cap portion and container are formed with surface roughness or rack teeth in adjacent surfaces to militate against relative turning movement when pressure conditions exist within the container sufficient to urge the cap portion to lift off of the container.

4,043,511

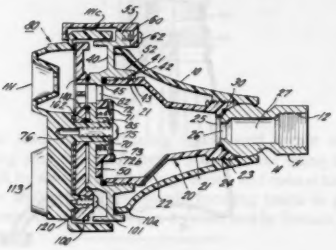
SHOWER HEAD

Toshio Nakamura, Mishima, Japan, assignor to Sanyei Corporation, Tokyo, Japan

Filed July 14, 1976, Ser. No. 705,354
Int. Cl.[2] A62C *31/02*
U.S. Cl. 239—394 10 Claims

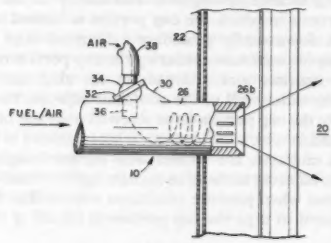
1. A shower head having a plurality of nozzles and comprising:

a holder;
an axial water flow passage through said holder;
a housing secured to said holder and having a wall transverse to said axial water flow passage;
a nozzle section rotatably mounted on said housing and having
a nozzle section wall parallel to said housing wall,
said nozzle section having a plurality of nozzles each radially spaced at the same distance from the center of rotation of said nozzle section with respect to said housing;
said housing wall having a water passage opening similarly radially spaced from the said center of rotation of the nozzle section with respect to said housing;



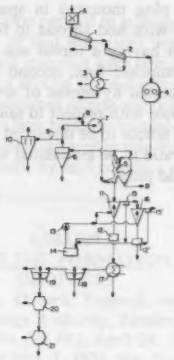
said nozzle section being rotatable to successively register one nozzle at a time with said water passage opening in said housing wall,
and a support disc bearing against said housing wall on the side thereof opposite the side on which said nozzle section is secured,
said support disc being connected to and rotatable with said nozzle section,
said support disc maintaining said nozzle section and housing wall parallel to each other and in contact with each other to prevent transverse leakage at the housing wall.

4,043,512
COAL BURNER
Norman K. Trozzi, West Caldwell, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.
Filed Jan. 23, 1976, Ser. No. 651,866
Int. Cl.[2] B05B 7/10
U.S. Cl. 239—402.5 **6 Claims**



1. A burner comprising:
a cylindrical housing for receiving fuel and having an outlet for discharging said fuel;
a tube disposed upstream of said outlet and extending through a wall of said housing, said tube having one end connected to a source of combustion-supporting fluid and the other end communicating with the interior of said housing for discharging said fluid in a direction substantially tangential to the inner wall of said housing, said fluid imparting a swirl to the fuel discharging from said outlet; and
support means for adjustably mounting said tube relative to the wall of said housing for movement of said tube in two orthogonal planes, one of said planes being substantially parallel to the direction of fuel flow through said housing and the other of said planes being substantially perpendicular to the fuel flow direction.

4,043,513
PROCESS AND APPARATUS FOR SORTING REFUSE
Heinz Hoberg, Am Rosenhugel 21, Aachen-Laurensberg, and Erwin Schulz, Turmstr. 29, Raeren, Belgien, both of Germany
Filed Feb. 20, 1976, Ser. No. 659,854
Claims priority, application Germany, Mar. 6, 1975, 2509764
Int. Cl.[2] B02C 23/14
U.S. Cl. 241—24 **23 Claims**

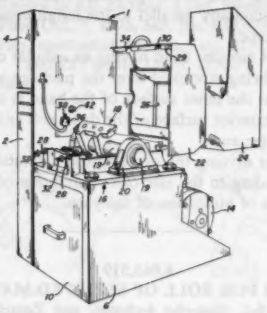


1. A process for sorting refuse into groups comprising the following consecutive steps:
a. sifting the refuse;
b. cutting the oversize obtained by step (a) to produce comminuted material;
c. separating the comminuted material obtained in step (b) by a gas stream into a light material fraction and a heavy material fraction;
d. separating the heavy material fraction obtained in step (c) by a liquid stream into components of relatively low and relatively high density;
e. magnetically separating the component of relatively high density into ferrous and non-ferrous parts; and
f. separating the non-ferrous part into a non-ferrous metal portion and a glass and ceramics portion.

4,043,514
COMMINUTION DEVICE
Russell I. Peterson, Jr., Bay City, Mich., assignor to Conair, Inc., Franklin, Pa.
Filed Mar. 16, 1976, Ser. No. 667,400
Int. Cl.[2] B02C 23/04
U.S. Cl. 241—36 **9 Claims**

1. A comminution device comprising: a housing member, a comminution structure consisting of a stationary member and a rotatable knife means, said comminution structure being supported by said housing member with said comminution structure having an upwardly open extent, a rotatable flywheel supported by said housing and coupled to said rotatable knife means to cause rotation thereof upon rotation of said flywheel, enclosure means movably supported by one of said members for selectively enclosing said open extent of said comminution

structure, means supported by said housing member having a movable portion selectively engageable with said flywheel for applying a motion restraining force to said flywheel, and said



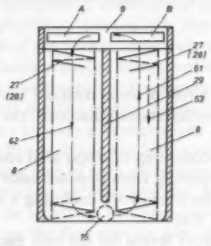
enclosure means being selectively movable into and out of engagement with said movable portion to control the application of said motion restraining force to said flywheel.

4,043,515

MACHINE FOR COMMINUTING AND MIXING MATERIALS

Hans Josef Bründler, Buttikon, Switzerland (CH-8863)

Filed Apr. 16, 1975, Ser. No. 568,417
Claims priority, application Germany, Apr. 25, 1974, 2420115
Int. Cl.[2] B02C *18/14*
U.S. Cl. 241—97 **16 Claims**



1. A machine, for use in continuously comminuting and mixing materials, especially animal and vegetable products, comprising in combination,

a mixing chamber structure including adjacent first and second mixing chamber portions, a first connecting passage at one end of said mixing chamber and interconnecting said first and second mixing chamber portions, and an unobstructed second connecting passage at the other end of said mixing chamber interconnecting said first and second mixing chamber portions free from obstructions,

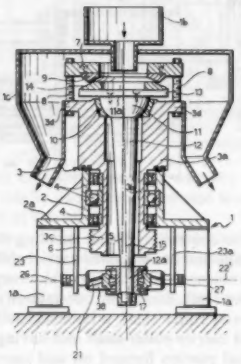
two comminuting devices disposed adjacent each other near said one end of said mixing chamber and a conveying and mixing means extending through the respective mixing chamber portion from each comminuting device, said comminuting devices and conveying and mixing means being operative to comminute and mix and convey said materials so as to convey them in an endless path throughout the first mixing chamber portion, thence through said second connecting passage into said second mixing chamber and thence through said comminuting devices and said first connecting passage and again into said first mixing chamber portion.

4,043,516

DISK MILL FOR MILLING CRUSHING OR GRINDING PEBBLES, GRAVEL, SMALL ROCKS AND THE LIKE

Tarcisio Pozzato; Mariano Pozzato, and Alberto Pozzato, all of Via Grattacavallo 2, Sandrigo, (Vincenza), Italy

Filed Mar. 23, 1976, Ser. No. 669,607
Claims priority, application Italy, Apr. 4, 1975, 22000/75
Int. Cl.[2] B02C *7/10, 7/14*
U.S. Cl. 241—252 **9 Claims**



1. A disk mill for milling, crushing or grinding pebbles, gravel, small rocks and the like, the mill comprising:

a support structure;

a first mount for mounting a first grinding disk having a working face;

first rotary mounting means rotatably mounting the first mount with respect to the support structure for rotation about a first axis;

a second mount for mounting a second grinding disk having a working face opposing the working face of the first grinding disk;

second rotary mounting means rotatably mounting the second mount with respect to the support structure and with respect to the first mount, for permitting the second mount to rotate about a second axis, the second rotary mounting means also permitting said second axis to be inclined relative to said first axis;

an extended control arm fixed to the second mount and projecting along said second axis;

a retaining member;

means mounting the retaining member for at least a restricted angular movement about a third axis at right angles to but substantially spaced from said first axis and substantially spaced from the second mount, and for translatory movement in a direction parallel to said third axis;

rotary bearing means connecting the retaining member to the control arm at a position substantially spaced from the second mount, which rotary bearing means permits the control arm to rotate about said second axis with respect to the retaining member and permits some twisting movement between the control arm and the retaining member about an axis parallel to the third axis;

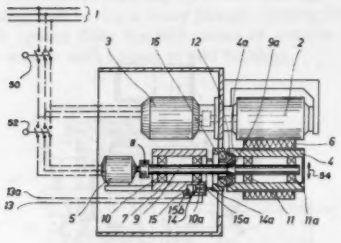
a double-acting fluid pressure actuator having a stationary part connected to the support structure of the mill and a movable part connected to the retaining member, for alternating the inclination of said second axis relative to said first axis; and

drive means for positively rotating at least one of the first and second mounts.

4,043,517
DEVICE FOR CONTROLLING THREAD SPOOLING DRIVES

Günter Jährig, Leopoldshafen, Germany, assignor to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Germany

Filed Dec. 5, 1975, Ser. No. 638,172
Claims priority, application Germany, Dec. 13, 1974, 2458996
Int. Cl.[2] B65H *54/40*
U.S. Cl. 242—18 DD 5 Claims

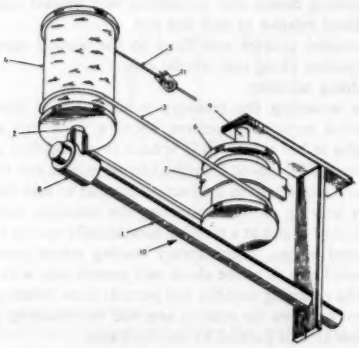


1. A device for controlling thead spooling drives in which the bobbin package and its associated carrier roller are frictionally driven by a motor driven drive roller, comprising a rotatable carrier roller shaft, means for continuously and rotatably driving said carrier roller shaft, a bobbin carrier roller freely rotatable on said carrier roller shaft and having a conical end portion, a conical portion formed on said carrier roller shaft adjacent to said conical end portion and having a conical shaft surface diverging in an opposite direction from said conical end portion, and a clutch cone having a double cone portion disposed between and engageable with said conical end portion and said conical shaft surface, means for shifting said clutch cone axially into engagement with said conical end portion of said bobbin carrier roller and said conical shaft surface of said carrier roller shaft.

4,043,518
POSITIVE YARN FEEDING DEVICE

Henry C. Gardner, Norge, Va., assignor to Dow Badische Company, Williamsburg, Va.

Filed Sept. 2, 1976, Ser. No. 719,781
Int. Cl.[2] B65H *59/00*
U.S. Cl. 242—45 4 Claims



1. A device for the positive feeding of yarn to a source of utilization of the yarn by rolling take-off from a yarn package of the type comprising a cylindrical support upon which the yarn is packaged by winding, which device comprises:

A. means for supporting the yarn package and permitting rotation thereof about the longitudinal axis thereof;

B. means for guiding the yarn from the package to the source of utilization of the yarn;

C. an drive roll positioned in proximity to, but spaced from the yarn package, and mounted for rotation about its longitudinal axis, the longitudinal axis of the drive roll being substantially parallel to the longitudinal axis of the yarn package;

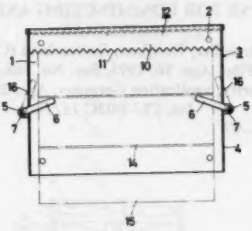
D. a resilient circular band having an annular cross-section, the band being stretched over the package and the drive roll so that the inner surface of the band is urged against both the exterior surface of the drive roll and the yarn on the package; and

E. means for driving the drive roll at a rotational velocity corresponding to the rate of consumption of the yarn by the source of utilization of the yarn.

4,043,519
HOLDER FOR ROLL OF STRIPPED MATERIAL

Teiji Suzuki, 6-2, Hon-cho 4-chome, and Zenichiro Mizuno, 5-11, Sakura-Josui 3-chome, both of Tokyo, Japan

Filed Mar. 10, 1976, Ser. No. 665,542
Claims priority, application Japan, Nov. 5, 1975, 50-149934[U]
Int. Cl.[2] B65H *19/02*
U.S. Cl. 242—55.53 2 Claims



1. A holder for a roll of sheet material having a cylindrical center hole of a predetermined diameter, the holder comprising

a. a framework consisting of a rear wall and a pair of lateral side walls projecting from opposed ends of the rear wall, the walls of the framework enclosing a space for accommodating the roll;

b. a pair of support levers for the roll, each of the support levers being pivotally mounted in a respective one of the side walls for free pivoting movement in a common plane extending perpendicularly to the side walls, each support lever having a tail end and a forward end, the forward ends projecting towards each other into said space, and the side walls being formed with respective grooves, each groove defining an upper shoulder engaging the forward end of an associated support lever when the support levers are pivoted upwardly in the common plane into a retracted position, said grooves having respective lower portions, said tail ends being pivoted to said side walls in said lower portions respectively, the length of the support levers being in excess of that of the grooves whereby only a portion of the support levers is received in the grooves in the retracted position and being shorter than the diameter of the center hole whereby the support levers are freely pivoted from the retracted position into a support position within the center hole when the center hole is in alignment with the support levers; and

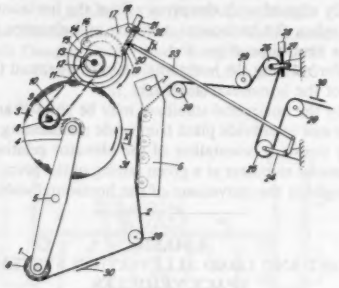
c. a cover for the roll, the lateral side walls having upper posterior portions and the cover having a rear edge pivotally attached to the posterior portions of the lateral side walls.

4,043,520

METHOD AND ARRANGEMENT FOR REGISTERED SPLICING OF A WEB OF MATERIAL WHILE IT IS IN MOTION

Willy John Olsson, and Harald Georg Swede, both of Malmo, Sweden, assignors to AB Ziristor, Lund, Sweden

Filed Oct. 7, 1975, Ser. No. 620,403
Claims priority, application Sweden, Oct. 11, 1974, 7412808
Int. Cl.[2] B65H *19/18, 21/02*
U.S. Cl. 242—58.1 9 Claims



1. A method for splicing a first web of material normally moving at a constant speed and having equally spaced indicia thereon to the leading end of a second web of material in roll form and having equally spaced indicia thereon with the same spacing as the indicia on the first web where the first indicia on the leading end of the second web and the last visible indicia on the second web adjacent the leading end thereof do not normally have the same spacing as between contiguous indicia, the first moving web passing adjacent the periphery of the roll of the second web, comprising, rotating the roll of the second web at a speed providing substantially the same peripheral speed as the speed of the first moving web, varying the speed of the first web during a part of each revolution of the roll of the second web to compensate for the uneven spacing between the first indicia and the last visible indicia on the roll of the second web and to provide a synchronized relation between the indicia on the first web and the indicia on the second web during the remaining part of each revolution of the roll of the second web, advancing or retarding the first moving web longitudinally of its length to provide exact registration between the indicia on the first moving web and the indicia on the second web during the remaining part of each revolution of the roll of the second web and finally splicing together the first moving web with the second web while the indicia are in exact registration.

4,043,521

CASTING REEL FOR FISHING

R. Dell Hull, Zebco, 6101 E. Apache St., Tulsa, Okla. 74101

Filed July 7, 1975, Ser. No. 593,461
Int. Cl.[2] A01K *89/04*
U.S. Cl. 242—84.41 7 Claims

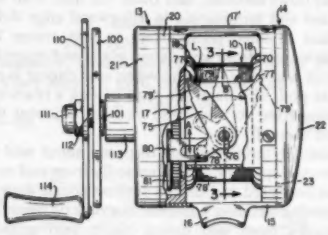
1. In a casting fishing reel including a line spool in spaced parallel relation, mounted on a spool shaft, end housings, pillar means supporting said end housing, bearings supported in said end housings and journaling the ends of said shaft, a drive mechanism selectively engageable with said shaft to rotate said spool in a predetermined line retrieval direction, a rotatable crankshaft for imparting torque to said drive mechanism, a reel with the improvement consisting of a level winding mechanism comprising

a. line guide wall means extending between said two end housings and having a shallow U-shaped opening defined at the upper edge thereof;

b. said U-shaped opening being of a width equal to the width of line supporting portions of said line spool;

c. pivot means mounted on said line guide wall means below said shallow U-shaped opening;

d. line distribution lever means pivotably mounted on said pivot means for swinging movement in a plane parallel to that of said line guide wall means and fully across and



beyond said U-shaped opening, whereby said U-shaped opening is totally unobstructed by said lever at the opposite ends of its travel;

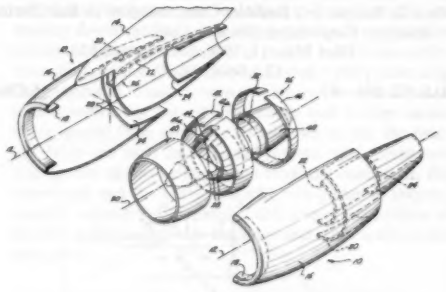
e. reciprocating drive means operatively interconnected between said drive mechanism and said line distribution lever means to reciprocate said line distribution means across said U-shaped opening during operation of said drive mechanism.

4,043,522

COMMON POD FOR HOUSING A PLURALITY OF DIFFERENT TURBOFAN JET PROPULSION ENGINES

Earl E. Vetter, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash. and Aeritalia S.p.A., Naples, Italy

Filed Dec. 22, 1975, Ser. No. 642,787
Int. Cl.[2] B64D *29/00*
U.S. Cl. 244—54 11 Claims



1. A pod for housing a turbofan jet propulsion engine selected from a plurality of different turbofan engines, said engine having a fan casing, a fan, a turine engine a turbine engine casing and a turbine outlet, said fan casing having a forward end defining a fan entrance plane and a rearward end defining a fan exit plane, said pod comprising:

an outer, annularly shaped, cowl member having a center line and a predetermined datum plane oriented transversely to the center line of said cowl member, said cowl member surrounding said center line and extending longitudinally from its forward end located forwardly of said datum plane to a rearward end located rearwardly of said datum plane, the forward end of said cowl member being radially convergent as it extends forwardly,

an annular inlet throat adjacent the forward end of said cowl member and being disposed about said cowl center line, the forward end of said throat being radially divergent as

it extends forwardly and merging with the forward enf of said cowl member to form an inlet highlight, said throat terminating in a rearward edge defining a throat oriented transversely to the cowl center line and located forwardly of datum said plane and forwardly from said fan entrance plane when said engine is positioned in said pod,

an outer, angularly shaped, fan duct wall disposed about said cowl center line and being spaced radially inwardly from said cowl member, said outer fan duct wall having a forward end terminating in a forward edge defining a first plane oriented transversely to said center line, located rearwardly from said datum plane and spaced rearwardly from said fan exit plane when said engine is positioned in said pod, said outer fan wall having a rearward edge and being fixed to said cowl member adjacent the rearward end thereof,

an annular turbine nozzle disposed about said cowl center line and spaced radially inwardly from said cowl member, the rearward end of said turbine nozzle forming a nozzle opening defining a turbine nozzle exit plane located rearwardly from said datum plane, said nozzle extending forwardly from said turbine nozzle exit plane and terminating in a forward edge defining a turbine nozzle entrance plane oriented transversely to said center line and positioned rearwardly from said datum plane,

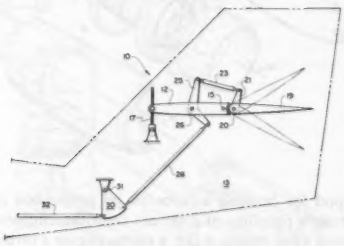
an inner, annularly spaced, fan duct wall spaced radially inwardly from said outer fan duct wall, the forward end of said inner fan duct wall terminating in a forward edge defining a second plane oriented transversely to said center line and located rearwardly from said datum plane, spaced rearwardly from said fan exit plane when said engine is positioned in said pool, and located forwardly of said turbine nozzle entrance, plane, said inner fan duct wall being located radially outwardly from said turbine engine casing when said engine is positioned in said pod, said inner fan duct wall converging toward said turbine nozzle as it extends rearwardly, and having a rearward end affixed to said turbine nozzle.

4,043,523

APPARATUS FOR AIRCRAFT PITCH TRIM

Otto E. Bartoe, Jr., Boulder, Colo., assignor to Ball Brothers Research Corporation, Boulder, Colo.

Filed Mar. 11, 1976, Ser. No. 665,833
Int. Cl.[2] B64C *13/30, 9/10*
U.S. Cl. 244—87 **4 Claims**



1. Apparatus for providing pitch trim and pitch control for an aircraft comprising:

an airframe having a longitudinal axis;

a horizontal stabilizer pivotally attached to the airframe around an axis transverse to the longitudinal axis of the airframe for movement from a neutral position relative to the airframe to up and down trim positions;

an elevator pivotally attached to the trailing edge of the horizontal stabilizer for movement from a neutral aligned position relative to the horizontal stabilizer to up and down control positions; a control horn extending from and above the elevator;

a bell crank pivotally attached to the horizontal stabilizer around an axis substanially parallel to the pivotal axis of the horizontal stabilizer, the bell crank having a first arm extending below the horizontal stabilizer and a second arm extending above the horizontal stabilizer;

a pivot member rotatably attached to the airframe;

primary control means connected to the pivot member;

a push tube extending between the control horn and the second arm of the bell crank, the push tube being pivotally connected to both the bell crank and the control horn;

an intermediate push tube extending between the pivot member the first arm of the bell crank and substantially longitudinally aligned with the pivot axis of the horizontal stabilizer when the horizontal stabilizer and elevator are both in the neutral position; and

means for rotating the horizontal stabilizer around the pivot axis of the horizontal stabilizer,

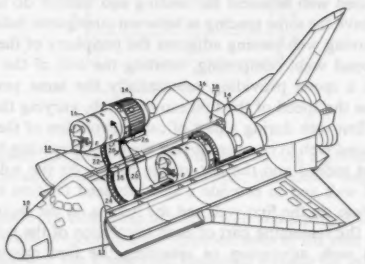
whereby the horizontal stabilizer may be rotated around its pivot axis to provide pitch trim while maintaining substantially constant orientation of the elevator relative to the horizontal stabilizer at a given setting of the pivot member throughout the movement of the horizontal stabilizer.

4,043,524

SUPPORT AND LOAD ALLEVIATION SYSTEM FOR SPACE VEHICLES

Wesley M. Dreyer, Encinitas, and Richard G. Huntington, San Diego, both of Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Filed Aug. 23, 1976, Ser. No. 716,418
Int. Cl.[2] B64D *9/00*
U.S. Cl. 244—118 R **4 Claims**



1. In a cradle system for supporting a space vehicle in a cargo bay of a reusable launch vehicle during launch and for deploying the space vehicle in outer space through a top bay opening, said cradle having a generally tubular configuration consisting of two longitudinally divided sections, hinged together so that an upper section can be rotated to deploy a space vehicle secured thereto, the lower section being secured to the space launch vehicle said cradle section constructed as closed box structures including inner and outer skins, radial frames and integrally machined edge closing beams; the improvement wherein said lower section is secured to said launch vehicle by six point support system comprising:

two lateral support fittings attached to the lower section at the lower centerline of said lower section, at the forward and aft edges, each lateral support fitting including a downwardly extending tongue fitting within a corresponding socket in the cargo bay surface, whereby loads in the transverse direction are reacted;

two aft attachment fittings located at the aft upper edges of said lower section include outwardly extending pins which engage corresponding sockets in the cargo bay surface, whereby loads in vertical and longitudinal directions are reacted; and

two forward attachment fittings located at the upper, for-

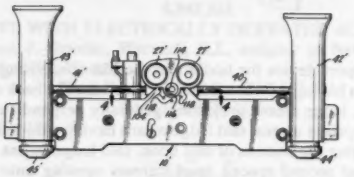
ward edge of said lower section including trunnions mounting outwardly extending pins adapted to engage corresponding sockets in the cargo bay surface, said trunnions being hingedly mounted on said lower section for rotation about a line substantially perpendicular to the cradle centerline, said forward attachment fitting further including liquid spring means connected between said trunnions and said lower section to restrain said rotation; whereby loads in the vertical direction are reacted.

4,043,525

VARIABLE ORIFICING DEVICE

Thaddeus Jakubowski, Jr., Long Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Mar. 31, 1976, Ser. No. 672,526
Int. Cl.[2] B64D *1/12*
U.S. Cl. 244—137 R **8 Claims**



6. A store carrier for mounting a jettisonable store on an aircraft and for releasing the store with ejective force applied to the store at least at two different locations by medium actuated thrusters, wherein the improvement comprises:

a housing enclosing a pressure chamber having at least one inlet for the introduction of medium and an outlet for each thruster; and

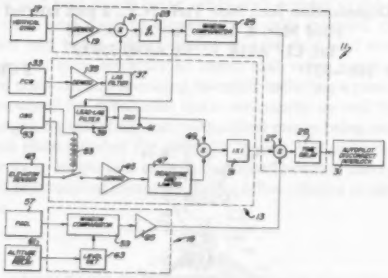
a member movable in said pressure chamber, said member having a plurality of orifices therein, said member orifices selectively cooperating with said outlets for the thrusters to selectively apportion the flow of medium thereto from a single location.

4,043,526

AUTOPILOT HARDOVER FAILURE PROTECTION SYSTEM

Shawn T. Donley, Richlandtown, Pa., and Valentine A. Freitag, Marlton, N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 23, 1976, Ser. No. 660,308
Int. Cl.[2] G05D *1/00*
U.S. Cl. 244—194 **48 Claims**



1. An autopilot failure protection system for an aircraft, comprising:

first signal processing means responsive to a signal indicative of the actual pitch attitude of the aircraft and for producing therefrom a pitch rate signal and a warning signal;

nuisance disconnect inhibiting means for receiving the pitch rate signal and an aircraft elevator signal and for producing an inhibit signal; and

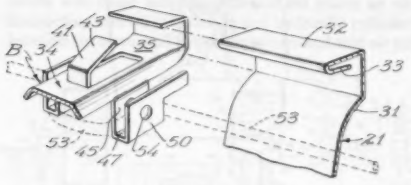
first summing means for receiving the warning signal and the inhibit signal, for producing a disengagement signal which represents the combination of the warning signal and of the inhibit signal, and for providing the disengagement signal to an aircraft autopilot.

4,043,527

HEATING CABLES

Alvin W. Franzmeier, 1042 E. Jenks, St. Paul, Minn. 55104

Filed May 13, 1976, Ser. No. 685,783
Int. Cl.[2] F16L *3/08*
U.S. Cl. 248—65 **4 Claims**



1. A heating cable support for use in combination with a rain gutter having an inner wall and an outer wall comprising:

a support member adaptable to be secured to at least one side of a rain gutter, said support member extending toward the other side of the rain gutter;

means located on said support member, said means adapted to accommodate portions of a heating cable in a predetermined location so that the heating cable can melt ice adjacent thereto, said means including an upwardly projecting hook directed toward the outer wall of the rain gutter;

further means adapted to accommodate portions of a heating cable, said further means including at least one strip extending downwardly from said support member, a bottom portion connected to the lower end of said downwardly extending portion of said strip, and an upwardly extending flange secured to said bottom portion in spaced relation to said downwardly extending portion, said further means being spaced from said support member so that the heating cable can melt ice adjacent thereto, said means and said further means being spaced from the inner wall, the outer wall and the bottom of said rain gutter to thereby provide support for a heating cable above the bottom of the rain gutter and within the inner and outer walls of the rain gutter.

4,043,528

RELEASABLE SUPPORT ROD

Roland Benoit, and John Polanski, both of Danielson, Conn., assignors to InterRoyal Corporation, New York, N.Y.

Filed Nov. 24, 1975, Ser. No. 634,398
Int. Cl.[2] A47H *1/14*
U.S. Cl. 248—251 **7 Claims**

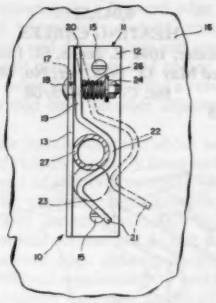
1. A releasable support rod structure comprising:

plate means disposed for securement in stationary relation to a wall structure and containing an exposed substantially flat vertically oriented face,

yieldable load-bearing means separate from and movably engageable with said flat face and having an upper portion abutting said flat face and a depending rod holding portion disposed in below said upper portion opposed facing relation to said flat face and selectively limitedly movably displaceable operatively toward and away from said flat face for holding an independent and separate rod engage-

ably releasably insertable thereat, said yieldable load-bearing means including means for adjusting the tautness thereof for presetting the load-bearing capacity of said yieldable means

said rod holding portion being relatively U-shaped in cross-section and having the corresponding open portion of the U-shaped portion thereof disposed in opposed facing



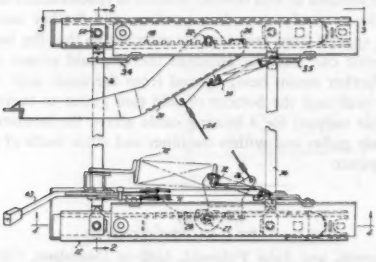
relation to said flat face and being selectively limitedly movably displaceable with respect to said flat face to disengage and release said rod under the weight of a downward overload relative to the selective load-bearing adjustment of said yieldable load-bearing means placed directly on said rod and transmitted through said rod to said yieldable load-bearing means.

4,043,529

SEAT ADJUSTING MECHANISM

Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Detroit, Mich.

Filed Oct. 20, 1976, Ser. No. 733,998
Int. Cl.[2] F16M *11/24*
U.S. Cl. 248—419 **8 Claims**



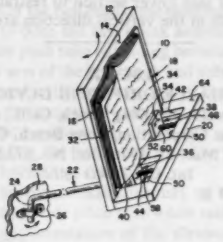
1. A manually operable four-way vehicle seat adjusting mechanism comprising a pair of stationary tracks, elongated carriages movable longitudinally of said tracks, rigid torsion bars having cylindrical intermediate portions and flattened end portions fixedly connected at the flattened end portions to said carriages to provide a rigid carriage assembly, torsion tubes mounted on the intermediate portions of said bars and journaled thereby for rotation thereon, lifting bell-cranks fixed to said tubes adjacent their ends, links extending longitudinally between the bell-cranks at each side of said mechanism, and a seat frame including longitudinally extending rigid frame bars pivotally connected at their ends to the bell-cranks at each side of the mechanism.

4,043,530

BOOK SUPPORT

Edward Eric May, R.D. 2, Box 242, Pine Bush, N.Y. 12566

Filed Nov. 10, 1976, Ser. No. 740,498
Int. Cl.[2] A47B *97/04*
U.S. Cl. 248—453 **2 Claims**



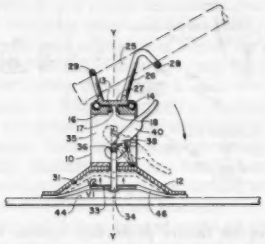
1. A support device for books and the like comprising: upright means having a front surface for receiving the back of an open book; ledge means projecting generally perpendicularly from said upright means, said ledge means having a top surface for supporting the bottom of said book; said ledge means having first and second spaced apart cutouts opening onto said front surface; and first and second clamp means respectively mounted in said first and second cutouts for holding said book open by respectively engaging side by side pages of said book; said first and second clamp means respectively comprising: first and second axles respectively mounted in said first and second cutouts directed generally perpendicular to said front surface; first and second apertured blocks respectively mounted about said first and second axles for sliding movement along said axles; first and second helical springs disposed respectively about said first and second axles; and first and second helical springs being located for respectively urging said first and second blocks toward said front surface; said first and second blocks being respectively selectively rotatable about said axles to first and second orientations, said blocks being shaped in a manner that said first orientation is characterized by said blocks extending above said top surface for engaging said pages and said second orientation is characterized by upper surfaces of said blocks being generally in line with the upper surface of said ledge means in order that said blocks do not engage said pages.

4,043,531

FISHING POLE HOLDER

Harvey L. Green, Scottsbluff, Nebr., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 8, 1976, Ser. No. 665,068
Int. Cl.[2] A01K *97/10*; A47G *25/12*
U.S. Cl. 248—537 **2 Claims**



1. A holder unit fitted with loop means for attachment to a fishing pole and with suction means for attachment to a flat

surface, in which the suction means comprise an expandable flexible cup linked through its center by a pin to a pivotable lever, and in which the loop means comprise a pair of wire loops each shaped as a U-member, with both loops mounted to a base, wherein

the flexible suction cup is mounted within a semi-flexible cup that is fixed to a hollow frame, which frame extends about the pivotable lever, with the base of the loop means pivotally mounted to the said frame at a location in which the center of rotation of the base with relation to the frame is an extension of the axis of the pin of the suction cup, so that the base rotates about an imaginary line extending through the center of the suction cup, and in which

each of the wire loops of the base extends in an opposed direction to said center of rotation and the center of the suction cup.

4,043,532

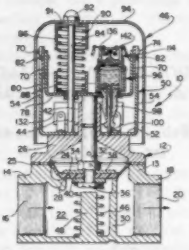
VALVE WITH ELECTRICALLY OPERATED ACTUATOR

Helmut J. Draxler, Warwick, R.I., assignor to New England Union Co., West Warwick, R.I.

Filed Jan. 29, 1976, Ser. No. 653,535

Int. Cl.[2] F16K *31/04*

U.S. Cl. 251—11 **14 Claims**



1. An electrically operated valve comprising a body having inlet and outlet passages formed therein, a valve member located between said inlet and outlet passages for controlling the flow of a fluid therethrough, a valve stem operatively interconnected to said valve member for producing controlled movement thereof and extending outwardly relative thereto and said valve body, and an operating assembly mounted on said valve body and operatively engaging said stem for producing the controlled movement thereof, said operating assembly including a bracket through which said stem extends, an electrically operated heat motor operatively mounted on said bracket, the axis of said heat motor being offset with respect to the axis of said stem, and resilient means operatively mounted on said bracket and being offset relative to said stem and normally urging said stem inwardly to locate said valve member in a closed position, said operating assembly including a plate member mounted for substantial linear movement on said bracket and engaging said stem, and said resilient means being mounted on said plate member for normally urging said plate member inwardly to locate said stem in the closed position thereof, the axis of said resilient means also being offset relative to said heat motor.

4,043,533

AUXILIARY CLOSING FORCE FOR VALVES

John M. Cowley, North Reading, Mass., assignor to Atwood & Morrill Co., Salem, Mass.

Filed Aug. 14, 1975, Ser. No. 604,733

Int. Cl.[2] F16K *31/122*

U.S. Cl. 251—57 **2 Claims**

1. A system for closing a steam valve and maintaining said steam valve shut comprising;

an actuating rod connected with said valve and movable to open and close said valve;

an air cylinder;

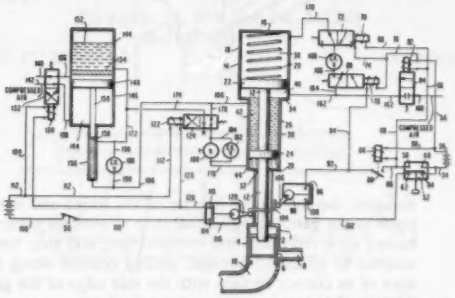
an air piston in said cylinder mounted on said actuator rod;

a spring connected with said actuator rod for urging said rod in a direction to close said steam valve;

a hydraulic cylinder;

a hydraulic piston mounted on said actuator rod between said air piston and said cylinder and slidably mounted in said hydraulic cylinder;

a power booster comprising; a pneumatic cylinder, an oil cylinder, a pneumatic piston slidably mounted in said pneumatic cylinder, an oil piston of substantially smaller area than said pneumatic piston, said oil piston being slidably mounted in said oil cylinder and connected with said pneumatic piston so that movement of said pneumatic piston will cause movement of said oil piston an oil line connecting said oil cylinder to said hydraulic cylinder at a location between said hydraulic piston and said air piston;



means to supply air under pressure to said air cylinder to hold said air piston and said actuating rod in a position whereby said steam valve is open;

means to place the opposite ends of said air cylinder in communication so that the air pressures on opposite sides of said air piston are substantially equal so that said spring urges said air piston and said actuator rod to move in a direction to begin an operation closing said steam valve;

means to exhaust the end of said air cylinder toward which said air piston is traveling to the atmosphere at a later portion of the closing operation so that the air pressure within said air cylinder exerts a force on said piston in the same direction as the force exerted on said piston by said spring; and

means to operate said power booster at a still later stage of the valve closing operation to supply oil to said hydraulic cylinder under pressure to urge said hydraulic piston in said direction to hold said steam valve shut.

4,043,534

SEALING MEANS FOR SLIDING GATE VALVE

Edward R. Gottshall, Bethlehem, Pa., assignor to Mosser Industries, Inc., Allentown, Pa.

Filed Sept. 13, 1976, Ser. No. 722,820

Int. Cl.[2] F16K *3/312, 3/316*

U.S. Cl. 251—174 **16 Claims**

1. A sliding gate valve for controlling the flow of a fluid comprising

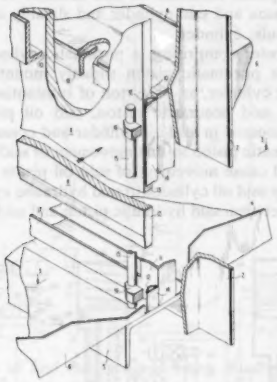
a. a frame having a bottom frame member a top frame member with an aperture therein generally transverse to the direction of fluid flow through the valve, and parallel, rectilinear side frame members;

b. a gate having parallel, rectilinear sides adapted for sliding movement through the aperture to a closed position within the frame to restrict the flow of fluid through the frame;

c. at least one of the frame members having fixedly mounted thereon, downstream of the aperture and in the interior of the frame, a flange which is parallel to the gate and

adapted to contact the downstream surface of the gate and limit the gate's downstream displacement when it is in the closed position and subjected to fluid pressure against its upstream surface; and

d. at least one of the side frame members having fixedly



mounted thereon, in the interior of the frame and in the plane of the gate, a longitudinal strip of resilient material having a curved transverse cross-section, said strip being adapted to effect compressed, sealing contact along the apex of its convex surface with the side edge of the gate when in the closed position.

4,043,535

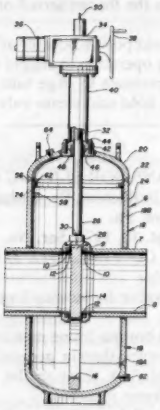
MEANS AND METHOD FOR REPAIR OF VALVES

John W. Freeman; Thomas M. Jones, and Harold D. Reagan, all of Houston, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Continuation of Ser. No. 548,308, Feb. 10, 1975, abandoned. This application June 30, 1976, Ser. No. 701,397

Int. Cl.[2] F16K *27/10*

U.S. Cl. 251—329 **5 Claims**



1. A valve structure comprising a longitudinal extending fluid conduit having a transverse opening therein, a valve body mounted about said conduit and transverse opening including a cylindrical upper body portion secured to said fluid conduit and extending in a perpendicular relation to the longitudinal axis of said conduit, a bonnet portion welded to the upper end of said upper body portion forming a continuation of and closing the upper body portion, a valve member mounted within the transverse opening and having a stem extending outwardly therefrom within the bonnet, means to move the valve member between open and closed positions relative to said fluid conduit, and a generally cylindrical sleeve mounted on the inner surface of the upper body portion generally adjacent the welded connection of the bonnet portion remote from the stem and having at least a portion thereof closely spaced from said inner surface a predetermined distance, said sleeve being welded along its lower marginal portion to the inner surface of the upper body portion and having its upper marginal portion free and unsecured in closely spaced relation to the inner surface of the upper body portion, said bonnet portion adapted to be cut circumferentially at a position laterally of said sleeve whereby the bonnet portion may be removed with an upper portion of the sleeve extending beyond the remaining upper body portion for repositioning of the removed bonnet portion.

4,043,536

DOOR DOLLY AND JACK

Lloyd T. Almond, 16005 N. 32nd St., Sp. 1316, Phoenix, Ariz. 85032

Filed Feb. 19, 1976, Ser. No. 659,272

Int. Cl.[2] B66F *3/00*

U.S. Cl. 254—2 R **4 Claims**

1. A device for elevating and supporting an object comprising:

a. an elongated, upright handle member;

b. support means fixedly mounted to said handle member providing underlying support for the object to be lifted;

c. floor engageable pivot means, said pivot means comprising roller means;

d. cable means having a foot insertable stirrup section, said cable means having a length such that upon insertion of the foot in said stirrup section and pressing of the foot on the floor, said pivot means are pivoted whereby said object supported by said support means is moved to an elevated position; and

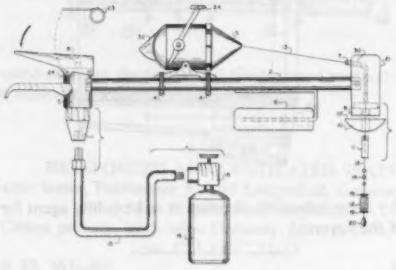
e. releasable locking means for releasably locking said pivot means.

4,043,537

APPARATUS FOR INSTALLING PULL LINES IN CONDUIT

John Charles Russo, Jr., 2100 Gen. Collins, New Orleans, La. 70114

Filed Nov. 12, 1976, Ser. No. 741,356
Int. Cl.[2] B65H *59/00*
U.S. Cl. 254—134.4 **6 Claims**



1. An apparatus for installing a pull line in a section of conduit, comprising:

a. an elongated, tubular body provided with a central conduit, said conduit capable of transmitting pressurized fluids therethrough;

b. valve means attached to one end portion of said body, for transmitting pressurized fluid from a pneumatic source through said valve means into said tubular body;

c. reel means affixable to said body for dispensing a length of line said reel means being provided with an integral spool of line therein;

d. dispensing means attached at the opposite end portion of said body from said valve means for transmitting pressurized fluid into a section of conduit, said dispensing means provided with a reduced tip portion insertable into the opening of said conduit, said dispensing means being oriented at substantially right angles with said elongated body; and

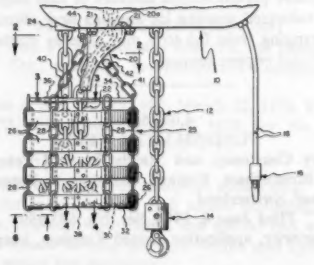
e. tube means on said dispensing means for guiding the line from said reel means through said dispensing means;

4,043,538

CHAIN HOIST

Kenneth D. Schreyer, Clarence, N.Y., assignor to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed Apr. 16, 1976, Ser. No. 677,770
Int. Cl.[2] B66D *1/00*
U.S. Cl. 254—168 **5 Claims**



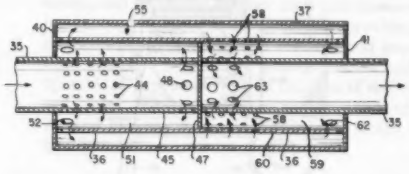
1. In combination, a chain hoist including an enclosing body portion having a slack chain exit opening therethrough; a slack chain transport chute fixed to said hoist body portion in chain transport communication with said slack chain exit opening; a flexible slack chain carrier, said carrier comprising a plurality of hoops, a bottom member, and a plurality of vertically extending chain strands, said chain strands having their lower ends connected to said bottom member and being connected to said hoops above said lower ends to maintain said hoops relatively movable interconnected in a vertically spaced apart relationship and a lowermost of said hoops in a circumscribing relationship relative to said bottom member for confining said slack chain within said carrier while permitting vertical and horizontal flexures of said carrier as required to withstand without failure external blows occuring during use of said hoist; and flexible support means for suspending said carrier below said body portion in slack chain communication with said chute.

4,043,539

METHOD AND APPARATUS FOR STATIC TYPE FLUID MIXING

William N. Gilmer, Chesterfield, and Vernon M. Barnes, Jr., Richmond, both of Va., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 28, 1975, Ser. No. 563,048
Int. Cl.[2] B01F *15/00*
U.S. Cl. 259—4 AB **4 Claims**



1. A static-type plural fluids mixer, comprising in combination

an imperforate first conduit forming an inlet for carrying longitudinally separated batches of said fluids therein,

said batches forming a continuous stream of said fluids,

a plurality of relatively small passages through the walls of said first conduit at a predetermined location down stream from said inlet for laterally diverting a portion of said stream,

an imperforate section of said first conduit down stream from said predetermined location for carrying all of the remainder of said stream a relatively substantial distance down stream from said predetermined location,

means for reversing the direction of flow of said remainder of said stream back toward said predetermined location, comprising

a relatively large passage at the down stream end of said imperforate section,

an end wall on said first conduit adjacent to and down stream from said relatively large passage,

a second imperforate conduit concentric with said first conduit,

said end wall extending laterally and forming the end wall of said second imperforate conduit,

said second conduit extending back at least to said predetermined location for carrying said remainder back to join with said portion of said stream, and

means forming an outlet for carrying said mixed stream.

4,043,540

MIXER PADDLE ASSEMBLY AND DRIVE SYSTEM

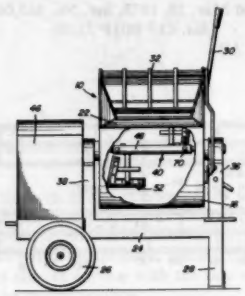
Guthrie B. Stone, deceased, late of Honeoye, N.Y., by Alan J. Stone, administrator, assignor to Stone Construction Equipment, Inc., Honeoye, N.Y.

Filed Sept. 26, 1975, Ser. No. 617,154
Int. Cl.[2] B28C *7/16, 5/14*
U.S. Cl. 259—171 **7 Claims**

1. In a mixer having a drum, a paddle shaft having a plurality

of paddles thereon, and means journaling the paddle shaft for rotation mixing material in the drum, that improvement comprising a rive assembly for driving said paddle shaft at a slow rotational speed including a large driven gear connected to the paddle shaft, a small driving gear meshed with the large gear, a power device having an output shaft driven at a high speed, and a speed reduction assembly interconnecting the output shaft and small driving gear, said speed reduction assembly including coplanar small and large pulleys and an encircling belt and coplanar small and large sprocket gears and an encircling chain arranged in series relationship.

3. In a mixer having a pivotally supported drum, a paddle shaft extending longitudinally of the drum and including paddles thereon, means disposed exteriorly of the drum for driving the paddle shaft, that improvement comprising shaft means connected with the paddle shaft and forming longitudinal extensions thereof, said shaft means being journaled in the opposite walls of the drum and being accessible exteriorly of



the drum, and means detachably connecting the shaft means with the paddle shaft to enable separation of the shaft means from the paddle shaft and removal of the paddle shaft and paddles from the drum without removing the drum from its support, said shaft means being in the form of a pair of stub shafts, each of said stub shafts being connected with an end portion of the paddle shaft closely adjacent to but spaced from the opposite walls of the drum, said stub shafts extending exteriorly of the drum for longitudinal removal of the stub shafts when the inner ends of the stub shafts are disconnected from the end portions of the paddle shaft, said paddles being rigidly and permanently secured to the paddle shaft, the opposite walls of the drum having external bearing assemblies journaling the drum for pivotal movement about a longitudinal axis concentric with the rotational axis of the paddle shaft with the bearing assemblies enabling insertion and removal of the stub shafts longitudinally in relation to the end portions of the paddle shaft.

4,043,541

BLAST FURNACE TUYERE

Emile Sprunck, 57250 Moyeuvre Grande, France

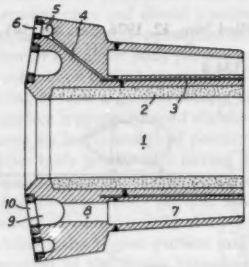
Filed July 27, 1976, Ser. No. 709,117

Claims priority, application France, Aug. 13, 1975, 75.25195

Int. Cl.[2] C21B *7/16*

U.S. Cl. 266—268 **3 Claims**

1. A blast furnace tuyere comprising a tuyere casing having an injection nose for insertion in a furnace and three separate injection chambers formed therein, said injection chambers each having open injection end portions located in the nose of the tuyere casing, said three injection chambers comprising a first chamber for hot blast to be supplied to the furnace, a second chamber for supplying combustible fuel to the furnace and a third chamber for supplying an auxiliary supporter of combustion to the furnace, said three chambers being isolated from each other in the casing with the combustible fuel injecting chamber being located between the other two chambers



whereby the combustible fuel serves as a cooling agent for the nose of the tuyere.

4,043,542

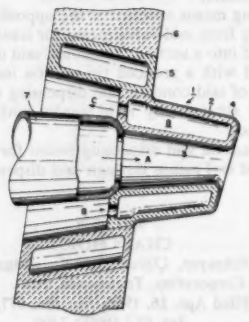
TUYERES FOR A BLAST FURNACE

Hiroshi Yamaoka, Hirakata; Morio Kawasaki, Nishinomiya; Hideyasu Kawanami, Wakayama; Toshihiro Shiino, Osaka, and Junichi Yamashita, Wakayama, all of Japan, assignors to Sumitomo Metal Industries Limited, Osaka, Japan

Filed Sept. 30, 1975, Ser. No. 618,248

Int. Cl.[2] C21B *7/16*

U.S. Cl. 266—270 **7 Claims**



1. A tuyere structure for blasting a gas into a blast furnace wherein said tuyere is composed of copper and wherein the inner and outer peripherential surfaces of said copper tuyere include a calorized coating of alumina and aluminum in a thickness ranging from 0.5 to 5 mm directly contacting said surfaces of said copper tuyere.

4,043,543

TUNDISH WITH WEIRS

John Henry Courtenay, and Martin Bernard Peter Wardell, both of Birmingham, England, assignors to Foseco Trading A.G., Chur, Switzerland

Filed June 8, 1976, Ser. No. 693,959

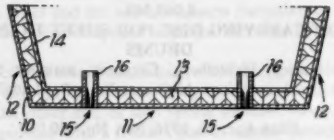
Claims priority, application United Kingdom, May 19, 1976, 20701/76

Int. Cl.[2] C21C *5/00*

U.S. Cl. 266—275 **10 Claims**

1. A tundish comprising a casing having a floor with at least one outlet nozzle located therein and upstanding sidewalls, the casing having a permanent refractory lining, and means for spacing any skull that is formed from at least one nozzle within the tundish and for minimizing extraneous material flow into

the nozzle, said means comprising an expendable consumable continuous partition of refractory heat insulating material



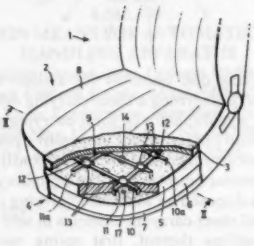
located adjacent the nozzle and dimensioned to stand proud of the adjacent portion of the tundish floor.

4,043,544

REINFORCED AND VENTILATED SEATS

Walter Ismer, Feldhausen 9, 4018 Langenfeld, Germany

Filed Mar. 8, 1976, Ser. No. 665,111
Claims priority, application Germany, Mar. 8, 1975, 2510182
Int. Cl.² A47C *27/12*
U.S. Cl. 267—83 **9 Claims**



1. A pad for seats, back rests, mattresses and the like comprising a pad body of plastic material, recess means in said pad body, a covering layer overlying said pad body and the recess means therein, strips of reinforcing material sandwiched between said pad body and said covering layer, at least selected ones of said strips being in alignment with said recess means whereby heat is dissipated from the covering layer through said recess means and the pad is reinforced by said strips, said recess means being a plurality of aligned apertures passing through said pad body, said selected ones of said strips overlie said apertures, disc means at the intersection of said strips, and the area of each said disc means being less than the cross-sectional area of an aperture.

4,043,545

SEALED CUSHIONING UNIT

Darrell D. Dial, Fort Worth, and Robert J. von Bose, Arlington, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 453,980, March 22, 1974, Pat. No. 3,864,972. This application Jan. 6, 1975, Ser. No. 538,803
Int. Cl.² F16F *9/10*
U.S. Cl. 267—116 **6 Claims**

1. An encapsulated shock absorber, comprising:

a. cylinder means having wall means including, side wall means, first end wall means, and second end wall means;

b. piston means slidably disposed within said hydraulic cylinder means and including,

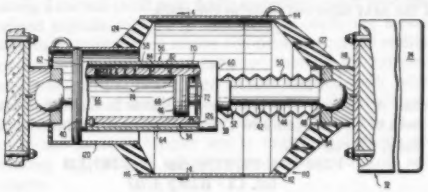
i. piston body means, translatably mounted within said side wall means of said cylinder means, for defining a buff-end impedance zone between said second end wall means and said piston body means and a restored end impedance zone between said first end wall means and said piston body, and

ii. piston rod means translatably projecting through said first end wall means of said cylinder means and having a first end thereof connected to said piston body means;

c. impedance means associated with said hydraulic cylinder means and said piston means for cushioning translation of said piston body means from a normal position of adjacency to said first end wall wherein said apparatus is in an extended posture operably ready to dissipate energy imparted thereto to a position of adjacency to said second end wall wherein said apparatus is in a contracted posture operably following dissipation of energy imparted thereto including:

i. generally low pressure fluid tight return flow passage means surrounding at least a portion of said side wall means of said cylinder means and being operable to receive fluid expelled from said buff end impedance zone in response to movement of said piston body means toward said second end wall means;

ii. at least one buff means, extending through said cylinder means in the vicinity of said second end wall means, for providing fluid communication between said buff end impedance zone and said return flow passage means and being operable to impede the flow of fluid out of said buff end impedance zone in response to movement of said piston body means toward said second end wall means; and iii. at least another draft port means extending through said cylinder means for providing fluid communication between said restored end impedance zone and said return flow passage means and being operable to impede the flow of fluid out of said restored end impedance zone in response to restoring force induced movement of said piston body means toward said first end wall means;



d. capsule means for encapsulating said hydraulic cylinder means, said impedance means and said piston means so as to isolate said hydraulic cylinder means, impedance means and said piston means from an ambient environment and for exerting a positive, outward bias upon said second, distal, end of said piston rod means away from said cylinder means for urging said piston body means toward a normal restored position adjacent to said first end wall of said cylinder means, including:

i. a longitudinally extending housing means surrounding said cylinder and passageway means;

ii. a first elastomeric annulus connected to and extending between one end of said housing means and one of said cylinder means generallly at the second end wall end thereof and a second distal end of said piston rod means;

iii. annular means connected to and extending between the other end of said housing and the other of said cylinder means generally at the second end wall thereof and a second distal end of said piston rod means;

e. normally closed valve means, associated with at least one of said buff port means, for providing a restricted hydraulic flowpath in response to all forces of less than a predetermined magnitude tending to move said first and second objects toward each other and for providing a less restricted hydraulic flowpath in response to all forces of at least said predetermined magnitude tending to move said first and second objects toward each other; and

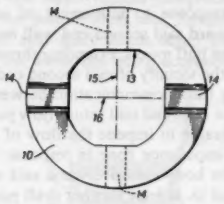
f. a quantity of hydraulic fluid confined within said buff end impedance zone, restored end impedance zone and imped-

ance means and isolated from pressurized contact with said capsule means.

4,043,546
COMPRESSION SPRINGS

Herbert Edward Ashfield, and Harry Horsfall, both of Huddersfield, England, assignors to David Brown Tractors Limited, Huddersfield, England

Filed Jan. 9, 1976, Ser. No. 647,746
Claims priority, application United Kingdom, Jan. 16, 1975, 1951/75
Int. Cl.² F16F *1/34*
U.S. Cl. 267—162 **6 Claims**

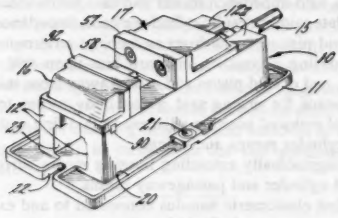


1. A compression spring comprising a support, a stack of separate coaxial washers surrounding said support and nonrotatably mounted on and along said support, each of said washers comprising an annular spring plate having a set of diametrically opposed projections on one side and another set of diametrically opposite projections on the other side, said sets being displaced at right angles, and the projections on each plate axially abutting the correspondingly oriented projections of the next adjacent plate in the stack.

4,043,547
PRECISION MACHINE VISE

Frank A. Glomb, Thornton, and William S. Griffith, Chicago, both of Ill., assignors to Chicago Tool and Engineering Company, Chicago, Ill.

Filed Dec. 10, 1976, Ser. No. 749,229
Int. Cl.² B23Q *3/02*
U.S. Cl. 269—136 **9 Claims**

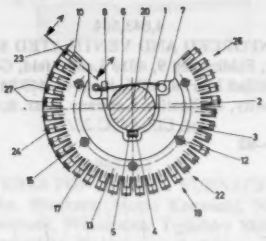


1. In a precision machine vise, the combination comprising a frame including a base and opposed horizontally extending rails having way surfaces, a cross member joining the rails at one end thereof, a fixed jaw bridging the rails at the opposite end, a movable jaw slideably superimposed on the rails for cooperating with the fixed jaw, a horizontal jack screw captively journaled in the cross member, a traveling nut on the jack screw between the rails, the movable jaw having a recess in its underside, the traveling nut having a rigid lug extending upwardly into the recess, the movable jaw and the lug having opposed force transmitting surfaces, a spring member interposed between the force transmitting surfaces, means interposed between the nut and the movable jaw for preloading the spring member, the spring member being oriented to apply a downward component of force between the movable jaw and the rails while permitting limited articulation between the movable jaw and the nut for self-alignment of the movable jaw with the presented surface of a work piece.

4,043,548
SHEET-CARRYING DISC FOR SHEET TRANSFER DRUMS

Gerhard Pollich, Heidelberg, Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Filed Apr. 26, 1976, Ser. No. 680,049
Claims priority, application Germany, Apr. 25, 1975, 2518334
Int. Cl.² B65H *29/20*
U.S. Cl. 271—80 **8 Claims**

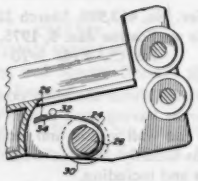


1. Sheet-carrying disc assembly for a sheet transfer drum carried by a shaft comprising a sheet-carrying disc mounted on the drum shaft, a multiplicity of sheet-carrying elements radially adjustable into operative and inoperative positions on said disc, said sheet-carrying elements being constructed as bar-shaped paper carriers disposed at the periphery of said disc, arresting means disposed on said sheet-carrying disc for releasably locking said sheet-carrying elements in said operative and inoperative positions thereof, first spring means yieldably biasing said sheet-carrying elements in axial direction of the drum shaft into locking engagement with said arresting means in said operative and inoperative positions of said sheet-carrying elements, each of said bar-shaped paper carriers having a longitudinal axis and being tiltable against the bias of said spring means out of said arresting means about a tilting axis extending in the plane of said sheet carrying disc transversely to said longitudinal axis, and second spring means yieldably biasing said sheet-carrying elements in radial direction of the drum shaft.

4,043,549
IMPACT FEEDER

Stephen A. Rinehart, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 24, 1975, Ser. No. 634,989
Int. Cl.² B65H *3/06, 3/48*
U.S. Cl. 271—118 **2 Claims**



1. A sheet feeding and separating apparatus comprising:
perforated tray means adapted to support a stack of sheets thereon;
means forming a plenum associated with said tray means, said plenum being adapted for connection to a source of pressurized air, said plenum communicating with the

perforations in said tray means for passage of pressurized air from said plenum through the perforations in said tray means to provide an air bearing between said tray means and the bottom sheet in the sheet stack, and between the bottom sheet and the adjacent sheets thereabove;

impact feed means disposed adjacent the edge of said tray means;

said impact feed means comprising a leaf spring member, one end of said spring member being mounted on a rotatable shaft, the other end of said spring member having a reduced portion with a friction pad mounted thereon; and,

abutment means disposed adjacent the bottom of the stack adapted for engagement with said spring member to maintain said spring member out of engagement with the bottom sheet in the stack, rotation of said rotatable shaft causing said spring member to wind therearound and move the spring member free of said abutment means, thereby allowing the end of said spring member having the friction pad thereon to impact the bottom sheet in the stack for feeding the sheet therefrom, the air bearing between the bottom sheet and the adjacent sheet thereabove cushioning the impact to prevent inter-locking of the bottom sheet and the adjacent sheet thereabove.

4,043,550

REGISTRATION MEANS FOR AUTOMATIC DOCUMENT HANDLING APPARATUS

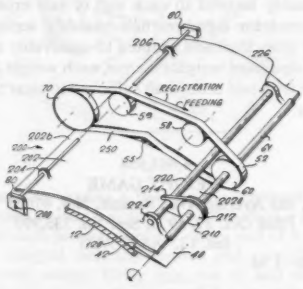
Kenneth G. Phillips, Bream, near Lydney; Richard P. Walford, Lydbrook, and Clifford Knight, Mitcheldean, all of England, assignors to Xerox Corporation, Stamford, Conn.

Filed May 17, 1976, Ser. No. 687,059

Claims priority, application United Kingdom, Oct. 24, 1975, 43931/75

Int. Cl.² B65H *9/04*

U.S. Cl. 271—233 **11 Claims**



1. A document handling apparatus including document feed means for feeding documents one at a time past a registration means into a processing area, document transport means positioned over said processing area and adapted to contact a portion of each of said documents for controlling its movement, said transport means being adapted to move said document in a first direction into said processing area, to reverse said document to move it in a second direction to register said document in cooperation with said registration means and, after processing, to move the document again in said first direction to remove it from said processing area;

baffle means overlying said processing area adjacent said registration means; and,

lift means for moving said baffle means into and out of engagement with said registration means, said baffle means being arranged such that in use of the apparatus, it is moved out of engagement with said registration means during movement of a document in said first direction into said processing area, and is moved into engagement with the registration means during movement of a document in said second direction to prevent movement of said document past said registration means during registration of said document.

4,043,551

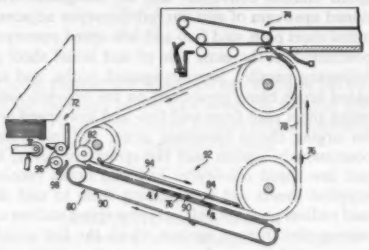
IN-LINE INSERTER

Wilbur J. Morrison, and Norwood E. Tress, both of Bath, Pa., assignors to Bell & Howell Company, Phillipsburg, N.J.

Continuation-in-part of Ser. No. 569,989, April 21, 1975. This application July 9, 1975, Ser. No. 594,255

Int. Cl.² B65H *9/06, 9/10*

U.S. Cl. 271—243 **4 Claims**



1. In a sheet feeding system comprising:

sheet supply means for supplying sheets one at a time; and

sheet transporting means for receiving said supplied sheets, transporting said sheets along an initial sheet path while simultaneously orienting said supplied sheets to have a predetermined attitude relative to said sheet transporting means, and thereafter transporting said supply sheets along a curved sheet path while maintaining said predetermined attitude relative to said sheet transporting means, said sheet transporting means comprising a curved endless conveyor having clamps mounted thereon for gripping and transporting said sheets in said curved path while maintaining said sheets in said predetermined attitude, said clamps including a means for opening said clamps at appropriate times to receive and to release said sheets and closing said clamps at appropriate times to grip said sheets;

the improvement wherein said sheet transporting means further includes a fast-speed endless conveyor, a low-speed endless conveyor, and an elongated brush positioned adjacent to said curved endless conveyor, said fast- and low-speed endless conveyors being adjacent to said initial sheet path and being positioned on the same side of said initial sheet-path following parallel, laterally spaced, paths, and said elongated brush being positioned on the opposite side of said initial sheet path from said fast- and low-speed conveyors for continuously urging sheets traveling along said initial sheet path against said fast speed conveyor, said fast- and low-speed conveyors and said brush receiving said supplied sheets and transporting them to said clamps, said low speed endless conveyor having pins thereon against which the fast-speed endless conveyor drives and, in cooperation with said brush, holds said supplied sheets to thereby orient said supplied sheets to have said predetermined attitude relative to said sheet transporting means, said fast- and low-speed endless conveyors and said brush being located relative to said clamps of said curved endless conveyor such that said sheets are held against said pins by said fast-speed endless conveyor and said brush as they enter and are clamped by said clamps of said curved endless conveyor to maintain said predetermined attitude.

3. In a sheet-feeding system comprising:

sheet supply means for supplying sheets one at a time; and

sheet transporting means for receiving said supplied sheets, transporting said sheets along an initial sheet path while simultaneously orienting said supplied sheets to have a

predetermined attitude relative to said sheet transporting means, and thereafter transporting said supplied sheets along a curved sheet path while maintaining said predetermined attitude relative to said sheet transpoting means, said sheet transporting means comprising a curved conveyor including a cylindrical drum and an endless belt pressing against said drum for gripping said sheets therebetween and transporting said sheets in a curved path while maintaining said sheets in said predetermined attitude;

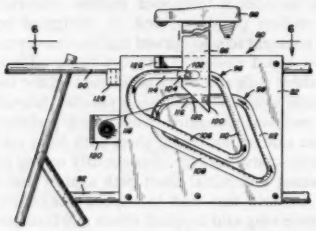
the improvement wherein said sheet transporting means further includes a fast-speed endless conveyor, a low-speed endless conveyor, and an elongated brush positioned upstream of said curved conveyor adjacent to said initial sheet path, said fast- and low-speed conveyors being positioned on the same side of said initial sheet path and following parallel, laterally-spaced, paths, and said elongated brush being positioned on the opposite side of said initial sheet path from said fast- and low-speed conveyors for urging sheets travelling along said initial sheet path continuously against said fast-speed conveyor, said fast- and low-speed conveyors and said brush receiving said supplied sheets and transporting them to said drum and said endless pressure belt, said low speed endless conveyor having pins thereon against which the fast-speed endless conveyor drives and, in cooperation with said brush, holds the supplied sheets to thereby orient the supplied sheets to have said predetermined attitude relative to said sheet transporting means, said fast- and low-speed endless conveyors and said brush being located relative to said drum and said endless pressure belt such that said sheets are held against said pins by said fast-speed endless conveyor and said brush as they enter a nip formed between said drum and said endles pressure belt in said predetermined orientation.

4,043,552

EXERCISER SEAT

Siragan K. Kerkonian, 6426 N. Ridge Ave., Apt. 2A, Chicago, Ill. 60626

Continuation-in-part of Ser. No. 587,213, June 13, 1975, abandoned. This application July 6, 1976, Ser. No. 703,102
Int. Cl.[2] A63B *21/00*
U.S. Cl. 272—120 **18 Claims**



18. An exercise seat assembly for use with a supporting frame comprising:

a housing;

means for attaching said housing to said frame;

a seat for a rider;

a seat support post, said seat being attached to said post;

a first guide member on said post remote from said seat;

a second guide member on said post intermediate said seat and said first guide member; and

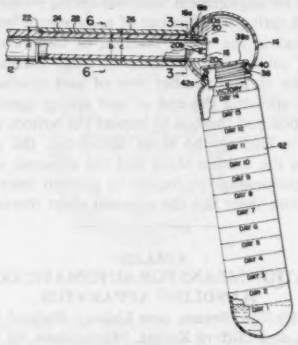
means associated with said housing for defining a trackway for each of said guide members, each of said trackways having a cross-sectional configuration substantially corresponding to the cross-sectional configuration of its respective guide member, each of said guide members being confined within its respective trackway thereby movably mounting said post to said housing for movement in response to the pushing and pulling by the rider.

4,043,553

ECCENTRIC ROTATABLE WEIGHT EXERCISING DEVICE

Richard A. Suarez, Canton, Ohio, assignor to Consumer Publishing Company, Inc., Canton, Ohio

Filed Jan. 23, 1976, Ser. No. 651,940
Int. Cl.[2] A63B *21/00*
U.S. Cl. 272—128 **11 Claims**



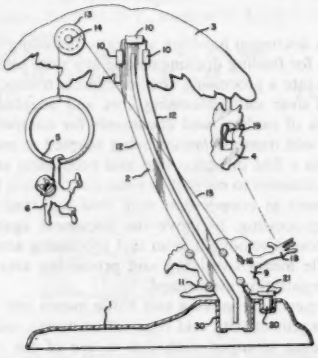
1. An exercise device for improving muscle tone comprising: a cross shaft; a pair of hand grips encircling the ends of said cross shaft positioned so as to maintain an exerciser's arms substantially parallel; means to eccentrically weight said cross shaft including a hollow elongated weight of deformable plastic non-rotatably secured to each end of said cross shaft by spherical connector members non-rotatably secured to the ends of said cross shaft and adapted to removably receive the ends of said elongated weights therein, each weight forming an obtuse angle with said cross shaft sufficient to clear the body of the exerciser.

4,043,554

WEIGHT GAME

Tobin Wolf, 285 Aycrigg Ave., Passaic, N.J. 07055

Filed Oct. 27, 1976, Ser. No. 735,997
Int. Cl.[2] A63F *9/00*
U.S. Cl. 273—1 M **18 Claims**



1. A game comprising:

a. a pulley,

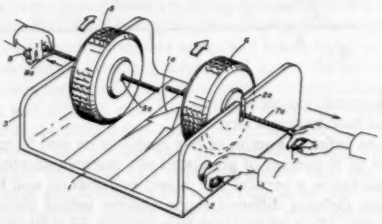
b. a string passing over said pulley,

c. weighted means at one end of said string,
d. weight receiving means at the other end of said string,
e. means responsive to a predetermined weight on said weight receiving means for moving said weighted means along a predetermined path, and
f. means responsive to predetermined travel of said weighted means along said predetermined path for adding additional weight to said weighted means, whereby said weighted means retraces its travel path to substantially its original position.

4,043,555
RACQUET STRING AND METHOD
Bartley Russell Conn, Mountain View, Calif., assignor to Irradiated Strings, Inc., Mountain View, Calif.
Filed Feb. 26, 1976, Ser. No. 661,734
Int. Cl.[2] A63B *49/00*; D02G *3/02*
U.S. Cl. 273—73 D **4 Claims**

1. A tennis racquet having stretched and tensioned synthetic strings with resilience similar to that of natural gut strings, said strings being produced by providing a filament of a polymer material and irradiating the filament with a radiation dosage of about 7.5 to 12.5 megarads, thereby causing crosslinking of molecules and increasing the stretch resilience of the filament.

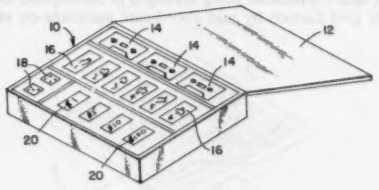
4,043,556
WHEEL ROLLING GAME
Cleto L. Lappa, 541 Torwood Lane, Pittsburgh, Pa. 15236
Filed Mar. 22, 1976, Ser. No. 668,847
Int. Cl.[2] A63F *9/14*
U.S. Cl. 273—86 R **1 Claim**



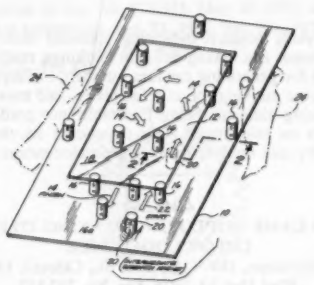
1. A game comprising a base having a pair of upstanding sidewalls, each having a slot on the top thereof, a pair of separate wheels each having a central slot, a pair of handles, each having an integral, helically twisted rod extending at right angles thereof, snugly fitting into one of said slots of each wheel, said rods being helically twisted in opposite directions, said handles extending outwardly of said sidewalls while said rods extend beyond the inward surfaces of said wheels while resting on said slots in a manner to hold the wheels slightly above the surface of said base, whereby as separate players pull the respective handles outwardly of said sidewalls, said wheels will spin by virtue of withdrawal of said rods so that upon complete withdrawal, said wheels will independently roll in the same direction without lateral movement.

4,043,557
APPARATUS AND METHOD INVOLVING THE CHANCE SELECTION OF SOUND RECORDED RACE RESULTS
Grant Johnston, 7722 Savannah Drive, Bethesda, Md. 20034
Filed Mar. 4, 1976, Ser. No. 664,023
Int. Cl.[2] A63F *9/00*
U.S. Cl. 273—86 R **3 Claims**

1. A simulated race game comprising at least one sound track having prerecorded thereon a plurality of accounts of races between a plurality of contestants, the race accounts having different finishing orders among the contestants, playback means for selectively audibly playing said race accounts, a plurality of betting cards for distribution to the game players, each of said cards being marked to indicate a contestant, at least one die for randomly selecting which of said race accounts is to be played, and simulated money to be bet by each player on the outcome of the race accounts selected for play with the betting cards distributed to each player indicating the contestants owned by the respective players.



4,043,558
MAGNETIC MAZE GAME
Scott Clifford Star, 60-33 61st St., Maspeth, N.Y. 11378
Filed Feb. 23, 1976, Ser. No. 660,454
Int. Cl.[2] A63F *3/00, 9/00*
U.S. Cl. 273—110 **11 Claims**

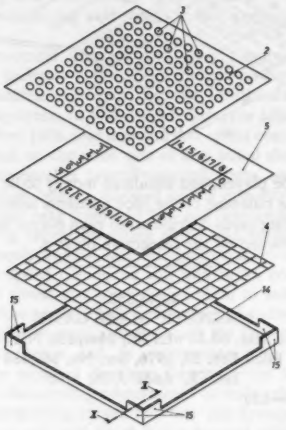


1. A magnetic game comprising:
a playing surface;
a plurality of magnets of varying strengths immovably positioned on said playing surface to define a predetermined maze or course; and
a magnetic playing piece movably placed on said surface, so that by turning and tilting the said playing surface the magnetic playing piece may be moved through the course without said playing piece being attracted to any of said immovable magnets.

4,043,559
EDUCATIONAL GAME
Manfred Eigen, Georg-Dehio-Weg 14, 34 Gottingen, and Winkler, Ruthild, 3431 Berlepsch, uber Witzenhausen, both of Germany
Filed Nov. 11, 1975, Ser. No. 630,793
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—130 R **14 Claims**

1. A game for education and entertainment comprising, in combination, a base plate having retaining means along the rim of said base plate; a plurality of templates on said base plate in superimposed position and retained on said base plate in predetermined position by said retaining means, said templates having coordinate markings along the rims thereof, said templates having different game markings, said templates being selectable for different games; a transparent covering plate over said

templates and said base plate and held in predetermined position by said retaining means, a selected template being on top of the remaining templates and being visible through said transparent cover plate, said cover plate having impression extending through at least part of the thickness of said cover plate, said impressions being arranged to correspond to a coordinate grid formed by said coordinate markings on said tem-



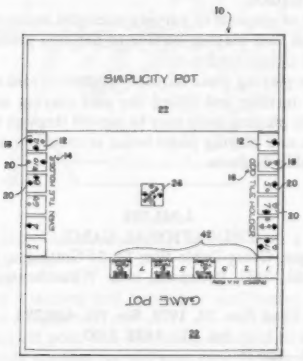
plates; movable position indicating elements insertable into said impressions and having different markings; random generator means for generating random numbers corresponding to the coordinate markings on said templates, said movable position indicating elements being insertable into predetermined impressions on said cover plate dependent on the number generated by said random number generator means.

4,043,560

BOARD GAME EMPLOYING PLAYING TILES AND COLOR CODED DICE

Irving L. Blackman, 180 N. La Salle St., Chicago, Ill. 60601

Filed Oct. 13, 1976, Ser. No. 732,167
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—135 AC **8 Claims**



1. A board game comprising in combination:

a game board having a series of areas provided with indicia therein keyable with identical indicia provided on a set of playing tiles, additional areas designated for the positioning therein of pre-valued elements, and a designated starting area having indicia therein keyable with like indicia carried by selected ones of said playing tiles;

a set of playing tiles subdivided into a series of sub-sets equal in number to the number of areas in said series of areas on the game board, each of said sub-sets comprising a plurality of playing tiles provided with identical indicia thereon, the indicia on the tiles of the respective sub-sets being identical to the indicia in a different one of the areas of said series of areas of the game board;

a set of three dice, a first of said dice carrying non-numerical indicia on each of the faces thereof, a second of said dice carrying a different even-numbered numeral on each of the faces thereof, and the third of said dice carrying different odd-numbered numeral on each of the faces thereof, said second and third dice each being color coded a different color, and said first dice having at least one of the faces thereof, color coded to correspond with the color on a different one of said second and third dice;

a set of pre-valued elements; and

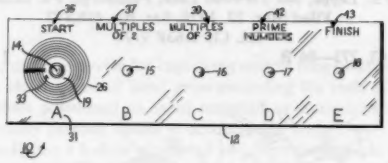
at least two playing tiles carrying indicia thereon identical to the indicia carried by the starting area of said game board.

4,043,561

PUZZLE AND METHOD OF PLAYING SAME

Daniel Marion Stepansky, 9801 S. Winchester, Chicago, Ill. 60643

Filed Aug. 23, 1976, Ser. No. 716,743
Int. Cl.[2] A63F *9/08*
U.S. Cl. 273—153 P **10 Claims**



1. A puzzle, comprising:

a flat base having a face;

means defining a series of five positions on said face;

a set of N number of graduated size markers adapted to be stacked in a vertical pile at said positions on said base;

means defining different single number indicia including a group of whole numbers two through six individually on different ones of said markers to identify each marker individually; and

means defining limited indicia designating certain ones only of said whole numbers but not all of said whole numbers of said group being disposed at least one of said positions to indicate that only said markers having the same numerical indicia thereon may be moved to the last-mentioned position in accordance with the puzzle rules.

9. A method of playing a puzzle, comprising:

providing a set of graduated size markers, each one having a different whole number indicia thereon, said indicia including the numbers two through six;

providing a base having a set of five positions on the face thereof, one of said positions being a starting position and having starting indicia, another one of said positions being a finishing position and having finishing indicia, at least one other one of said positions being a limited position and having limited indicia designating certain ones only but not all of said whole numbers two through six;

stacking said markers in a vertical pile at the starting positions;

moving said markers seriatum from said pile to other positions with smaller markers always being placed above larger markers according to puzzle rules;

moving to the limited position only those markers having corresponding number indicia according to puzzle rules; and

moving markers from the limited position and the other

positions to the finishing position with smaller markers always being placed above larger markers according to puzzle rules.

4,043,562

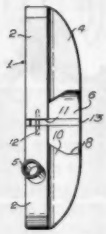
PUTTER ALIGNMENT SIGHT

Brian G. Shillington, 601 E. Anatamu Ave., Santa Barbara, Calif. 93101

Continuation-in-part of Ser. No. 539,793, Jan. 9, 1975, abandoned. This application Mar. 22, 1976, Ser. No. 669,024

Int. Cl.[2] A63B *53/04*

U.S. Cl. 273—164 **5 Claims**



1. A golf ball putter comprising:

a. a putter blade having a forward putting face, a rear face and upper and lower faces;

b. a recess in said blade extending forwardly from said rear face, said recess having upper and lower surfaces adjacent to but spaced from said upper and lower faces, to define rearwardly extending upper and lower flanges respectively, and a forward surface parallel to said putting face;

c. a slot through said upper flange extending rearwardly from at least said forward surface of said recess perpendicular to said putting face and communicating with said recess and being of a depth no greater than said upper flange and defining a reference edge at its juncture with said forward surface, said reference edge being spaced upwardly from said lower surface substantially the full height of said recess; and

d. a reference line on said lower surfsce extending parallel to said putting face and being below said slot to be visible therethrough and spaced rearwardly from said forward surface of said recess a sufficient distance such that said reference line remains in full view and undergoes apparent forward-rearward displacement with respect to said slot and reference edge as the golfer moves his head, respectively, forwardly or rearwardly.

4,043,563

GOLF CLUB

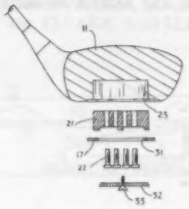
Roy Alexander Churchward, 6444-19th Ave. S., Richfield, Minn. 55423

Continuation-in-part of Ser. No. 423,080, Dec. 10, 1973, which is a continuation-in-part of Ser. No. 277,739, Aug. 3, 1972, abandoned. This application Nov. 6, 1975, Ser. No. 629,277

Int. Cl.[2] A63B *53/08*

U.S. Cl. 273—171 **8 Claims**

1. A golf club sole plate comprising a thickened central portion and a thin plate-like portion surrounding said central portion, said central portion including a recess on the lower side thereof, said central portion further including a plurality of openings, at least some of said openings extending through said central portion from the upper surface to said recess, said sole plate further including weights and a removable cap, said



weights being slideably engaged in said openings, said removable cap providing access to at least some of said weights.

4,043,564

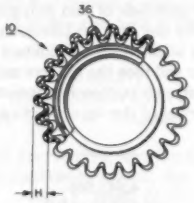
PITMAN SHAFT BOOT SEAL

David G. White, Phelps, N.Y., assignor to Garlock Inc., Palmyra, N.Y.

Continuation of Ser. No. 473,331, May 28, 1974, abandoned. This application Aug. 22, 1975, Ser. No. 607,065

Int. Cl.[2] F16J *15/50*

U.S. Cl. 277—212 FB **1 Claim**



1. A seal for use between a pair of axially spaced-apart, coaxial members which are axially and arcuately relatively movable comprising:

a. a flexible, generally cylindrical, annular seal member having an axially extending opening therethrough concentric to said seal member, said seal member also having a single wall and having a first static sealing surface on an axially outer surface at one end thereof, and a second static sealing surface on an axially outer surface at the other end thereof,

b. annular compression spring means located inside of said seal member for forcing said two ends thereof away from each other and for providing a sealing force for said static sealing surfaces,

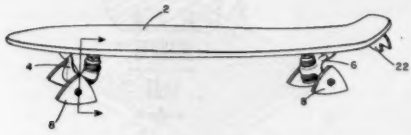
c. said seal member having a generally cylindrical portion including a plurality of spaced-apart, hollow, elongated, substantially straight ribs with their longitudinal direction being in a direction generally parallel to the axis of the seal member, said ribs extending in an axial direction substantially the entire length of said seal member, and

d. each of said hollow ribs having a pair of spaced-apart radial sidewalls and a single circumferential wall extending between the radially outer ends of each pair of sidewalls, and wherein each of said ribs tapers in a radial direction from a wider thickness at its proximal end to a narrower thickness at its distal end.

4,043,565
RECREATIONAL DEVICE

Paul Mogannam, 3220 Geary Blvd., San Francisco, Calif. 94118

Filed May 25, 1976, Ser. No. 689,744
Int. Cl.[2] A63C *1/30*; B62B *13/06*
U.S. Cl. 280—11.12 4 Claims

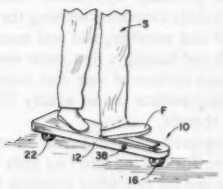


1. A recreational device for use on ice, comprising
an elongated board-like member for supporting a user;
runner mounting means affixed to the underside of said member, said mounting means comprising a first mount positioned proximal one end of said member and a second mount in tandem with said first mount and positioned proximal the other end of said member, each said mount including means for attaching a pair of ice runners thereto in spaced, parallel relationship and for providing for pivoting movement of such runners relative to the longitudinal axis of said member in response to a shift of weight of said user on said member; and
two pairs of ice runners attached to said runner mounting means by means providing for selective repositioning of said runners, one pair to each said mount, each said runner having a plurality of ice-contacting portions selectively positionable for ice contact by any selected one of said portions and each said runner being generally polygonal in profile with each side of said polygon being convexly arcuate, whereby one such ice contacting portion of each runner may be selected for ice contact until it has been dulled by usage and then the runners may be repositioned to bring another such portion into ice-contacting position to effect a renewal of the ice-contacting areas of the runners.

4,043,566
SKATEBOARD

Noel K. Johnson, 1370 Beryl, San Diego, Calif. 92109

Filed Apr. 27, 1976, Ser. No. 680,967
Int. Cl.[2] B62B *7/00*
U.S. Cl. 280—87.04 A 5 Claims

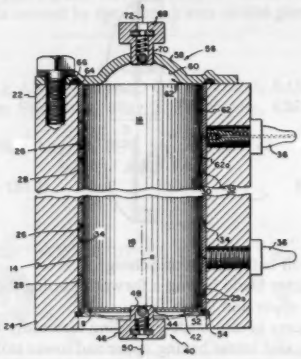


1. A skateboard comprising:
a low elongated substantially horizontal body having a front and a rear end,
front and rear ground engaging support wheel means carried by corresponding end portions of said body, said support wheel means being adapted to support a load thereon, and
brake means on said body for slowing said body by engagement with the ground in response to pivotal movement thereof by the load supported on said body,
said brake means including
a substantially planar member having a front and rear portion pivotally mounted in an opening in said body, and
a depending stop member on the rear portion of said planar member,
the front end of said body including a rearwardly projecting shoulder for abutting engagement with a forwardly projecting lip on the front portion of said planar member when said planar member is in a substantially horizontal position.

4,043,567
STEERING AXLE ASSEMBLY

Virgil W. Kaiser, deceased, late of Saginaw, Mich. (by William J. Kaiser, administrator, assignor to V. W. Kaiser Engineering, Inc., Millington, Mich.

Filed Mar. 18, 1974, Ser. No. 451,935
Int. Cl.[2] B62D *7/18*
U.S. Cl. 280—96.1 7 Claims



1. In a steerable axle assembly, a vehicle steering member having a generally vertical cylindrical bore open at both ends, a bushing provided within said bore and comprising a spirally wound bearing strip having an internal spiral groove and aperture means communicating the outer circumferential surface of said bushing with said groove for the passage of lubricant therebetween, said spiral bushing having an outside diameter greater than the internal diameter of said bore for being sprung into retained engagement therewithin, a king pin having a sinusoidal groove provided thereon and received in one end of said bore and within said bushing, means for introducing lubricant to said bore and externally of said bushing, and means for sealing the opposite end of said bore to preclude the passage of lubricant therethrough until said sinusoidal groove, bushing groove and aperture means have been fully packed.

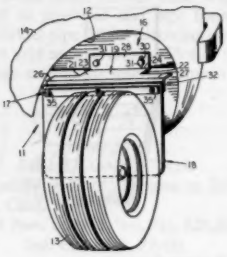
4,043,568
MUD FLAP ASSEMBLY

James F. Hollon, Box 533, Milan, Ill. 61264

Filed Sept. 22, 1976, Ser. No. 725,911
Int. Cl.[2] B62D *25/16*
U.S. Cl. 280—154.5 R 3 Claims

1. A mud flap assembly, for attachment to a vehicle known as the Blazer, the Blazer having a body attached over a frame mounted on wheels, the body having fender wells formed therein about the wheels, said assembly comprising:
an elongated cover strap;
an elongated mud flap;
bracket means for supporting said mud flap, said bracket means including a base member and first and second flanges, said base member having front and rear longitudinal edges, said first flange being attached at said rear longitudinal edge normal to said base member, said second flange being attached at said front longitudinal edge normal to said base member, said first and second flanges extending to opposite sides of said base member, said base

member having first and second cut-out portions formed therein, said base member having disposed at each end thereof one of said cut-out portions and directed toward the rear thereof both of said cut-out portions, whereby said rear longitudinal edge is made shorter than said front longitudinal edge, said first cut-out portion being longer than said second cut-out portion; and



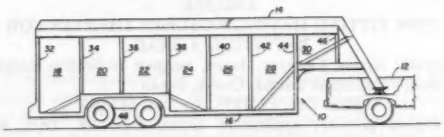
said first flange being detachably affixed within a fender well and behind a wheel of the vehicle, said first cut-out portion extending to the inside of the fender well toward the frame, said mud flap being placed against said second flange, said cover strap being detachably affixed to said second flange over said mud flap, said mud flap being held between said cover strap and said second flange and depending therefrom and behind the wheel.

4,043,569

TRANSPORT VEHICLE

Roger D. Ratliff, Irving, Tex., assignor to PepsiCo Inc., Purchase, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,139
Int. Cl.² E62D *53/00*
U.S. Cl. 280—423 R **9 Claims**



1. In a transport vehicle, an integrally joined frame assembly comprising, in combination:

a. an upper frame structure including at least one elongate generally horizontal beam extending in the direction of vehicle travel, said beam having a forwardly projecting and downwardly inclined portion joined to the first end thereof and conjointly forming a load-bearing backbone structure for said vehicle;

b. a lower frame structure including at least one elongate beam extending in the direction of vehicle travel and being fastened to said downwardly inclined portion of the upper elongate beam, said elongate beam of said lower frame structure being essentially constituted of at least one structural channel member;

c. a plurality of longitudinally spaced, transversely extending, vertical divider members being interposed between and interconnecting said upper and lower elongate beams and suspending said lower elongate beam from said upper horizontally-extending beam for forming a plurality of load-receiving bays in said vehicle;

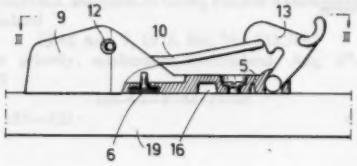
d. and means for supporting the forward portion of said frame assembly, and means for supporting the rearward portion of said frame assembly.

4,043,570

SKI BINDING

Pentti Riikonen, Kiverionkatu 12 B48, Lahti, Finland

Filed May 5, 1976, Ser. No. 683,042
Claims priority, application Finland, Mar. 15, 1976, 760671
Int. Cl.² A63C *9/20*
U.S. Cl. 280—615 **4 Claims**



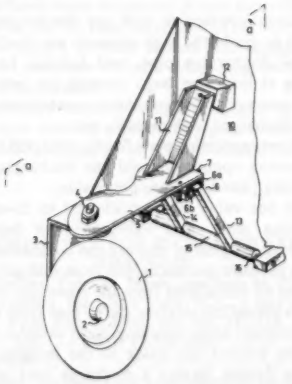
1. A ski binding comprising a one-piece toe part having a foot plate, screw holes formed in said foot plate for screws to attach the binding to a ski, a pair of lugs positioned on either side of said toe part, a bushing carried by each of said lugs, a forwardly directed clamping yoke having arms journaled in each of said bushings so as to be elastically urged against the upper surface of a welt of a sole of a boot to be clampingly held in said binding, a continuation portion extending from said toe part, said continuation portion having downwardly extending side walls and a top cover forming a downwardly open recess closed by the upper surface of the ski, said top cover having an opening, and a locking member having a journaling axle formed integral therewith pivotally carried in said downwardly open recess of said continuation portion and having means extending through said opening normal to said axle for releasably engaging said clamping yoke for locking said yoke against said welt to secure said boot in the binding.

4,043,571

SUSPENSION SYSTEM

Francois Guerbet, 6 rue de Vergennes, Versailles, France (78000)

Filed Apr. 9, 1976, Ser. No. 675,599
Claims priority, application France, Apr. 15, 1975, 75.11754
Int. Cl.² B60G *11/60*
U.S. Cl. 280—716 **5 Claims**



1. A suspension system for connecting an axle support for a wheel of a vehicle to the chassis of the vehicle comprising:

a. a hollow cross frame containing a bar maintained in said frame by means of elastic fittings;

b. a support for an axle to carry a wheel, said support being fixed to said hollow cross frame;

c. at least one connecting arm connecting said hollow cross

frame to the chassis of the vehicle through an elastic block;

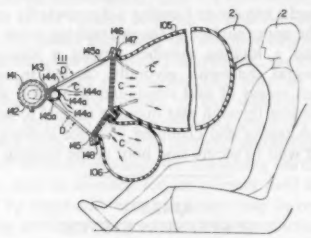
d. at least one connecting arm connecting said bar to the chassis of the vehicle through articulation means; said hollow cross frame being disposed at an intermediate height between the height of the elastic bar and the height of said articulation means, thereby to form, in projection on a vertical plane, a deformable triangulated suspension system.

4,043,572

AIR BAG DEVICE FOR VEHICLES

Yoshiyuki Hattori, Nagoya; Mikio Suzuki, Hekinan, and Masahiro Taguchi, Nishio, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed July 17, 1975, Ser. No. 595,742
Claims priority, application Japan, Aug. 21, 1974, 49-96314
Int. Cl.[2] B60R *21/08*
U.S. Cl. 280—738 **4 Claims**



1. An air bag device for vehicles comprising:

a. a gas supply source for supplying high pressure gas;

b. a gas discharging pipe communicated with said gas supply source and adapted to discharge high pressure gas therethrough;

c. a housing mounted to said gas discharging pipe and adapted to guide the high pressure gas discharged from said gas discharging pipe, said housing having means defining at least one large opening for introducing air from a passenger compartment in consequence of the gush of the discharged high pressure gas;

d. at least one supporting plate fixedly mounted to one end of said housing opposite to said gas discharging pipe, said supporting plate being gas permeable;

e. at least one valve member adapted to cover over said supporting plate, said valve member being directly opened by the gush of mixture gas constituted by mixing of high pressure gas discharged from said gas discharging pipe and air introduced from the passenger compartment so as to permit the mixture gas to pass from the inside of said housing, while blocking most counter-flow in the direction toward the inside of the housing, said valve member further having a discharge port means which allows part of the counterflow to pass therethrough; and

f. inflatable bag means adapted to cover over said valve member, and to be inflated by the mixture gas which opens said valve member to pass through the latter;

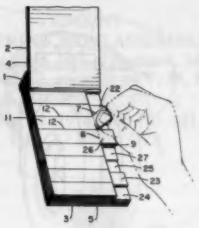
said valve member comprising an inner portion which is made of resilient material having discharge holes, and an outer portion of air permeable material surrounding said inner portion.

4,043,573

NOTE PAD CONSTRUCTION

Arthur F. Griffin, 1300 E. Fairhaven Ave., Apt. 6, Santa Ana, Calif. 92701

Filed July 5, 1974, Ser. No. 486,188
Int. Cl.[2] B42D *5/04*
U.S. Cl. 283—2 **3 Claims**



1. A note pad comprising:

a plurality of stacked pages, each said page including means to visually differentiate a given said page from other adjacent said pages, each said page including a plurality of separate vertically spaced sections, each said section being adapted to accommodate writing thereon;

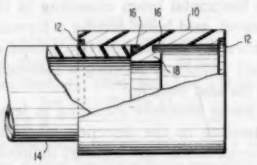
each said page having a series of detachable tabs laterally positioned in respect to said sections with there being a single said detachable tab for each said section, said tabs being detached from each other, whereby each said section being adapted to receive indicia in the form of writing to denote different tasks to be performed, upon a performing of the particular task for which an indicia within a given said section denotes the particular said tab for that section is removed and the absence of that said tab is prominently displayed against the contrasting visual background of the tab of the adjacent said page, thus permitting the rapid visual scanning of the remaining tabs to determine the status of all items listed on the page.

4,043,574

PIPE FITTING HAVING NOTCHES THEREIN FOR RECEIVING A BEAD

Teryoshi Asano, Kawagoe, Japan, assignor to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 18, 1975, Ser. No. 642,042
Claims priority, application Japan, Dec. 18, 1975, 49-154030[U]; Apr. 9, 1975, 50-48374[U]
Int. Cl.[2] F16L *13/10*
U.S. Cl. 285—21 **1 Claim**



1. In a cylindrical resin material pipe fitting for thermal fusion to a resin material pipe insertably received within one end of said cylindrical pipe fitting, said pipe fitting having an annular projection on the internal surface of said pipe fitting axially inward of the open end of said pipe fitting and serving as a stop for the inserted pipe, the improvement comprising the external diameter of said pipe being slightly greater than the internal diameter of said pipe fitting, and a first annular notch within the side wall of said projection facing said inserted pipe and a second annular notch within the edge of said cylindrical

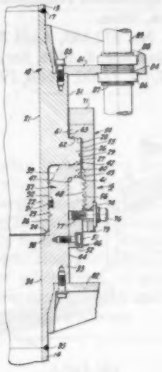
pipe fitting receiving said inserted pipe on the inner periphery thereof; whereby, during fusing operation some molten resin forced towards said annular projection due to the force fit of the pipe within the pipe fitting is received within said first annular notch to facilitate fusion of said cylindrical pipe fitting to said inserted pipe and is prevented from projecting radially inwardly beyond the edge of the inserted pipe and from becoming an impedent to the free flow of fluid through the pipe and pipe fitting, while other molten resin which escapes between said forced fit pipe and said pipe fitting adjacent the edge of said cylindrical pipe fitting receiving said inserted pipe, is received within said second annular notch to eliminate the formation of a ridge around the inserted pipe at the edge of the pipe fitting.

4,043,575

RISER CONNECTOR

Albert B. Roth, Lafayette, Calif., assignor to The Rucker Company, Oakland, Calif.

Filed Nov. 3, 1975, Ser. No. 628,531
Int. Cl.[2] F16L *39/00*
U.S. Cl. 285—90 **4 Claims**



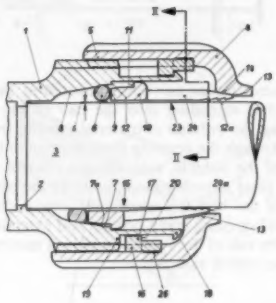
1. A riser connector for use between first and second pipe sections comprising a pin fitting adapted to be secured to the end of said first pipe section, said pin fitting including an end sleeve having a circular-cylindrical exterior surface, and said pin fitting including an outwardly projecting first peripheral flange having a planar first lower pin surface and a planar first upper pin surface, said first peripheral flange also having exterior peripheral cut-out portions leaving first intervening portions, a box fitting adapted to be secured to the end of said second pipe section, said box fitting including an end box having a circular-cylindrical interior surface adapted to telescope with said circular-cylindrical exterior surface, and said box fitting including an outwardly projecting second peripheral flange having a planar second lower box surface and a planar second upper box surface adapted directly to contact said first lower pin surface, and annular nut rotatable about said first and second peripheral flanges and having interior threads facing said box fitting, an inturned flange on said nut having an inwardly projecting planar lower nut surface adapted to contact said first upper pin surface, said inturned flange also having interior cut-out portions of an extent to pass said first intervening portions and leaving second intervening portions of said inturned flange of an extent to pass through said peripheral cut-out portions, an annular collar extending around and rotatable on said box fitting, said collar including a planar end surface adapted to abut said second lower box surface and also including exterior threads adapted to interengage said interior threads on said annular nut, and means engaging said collar and said box fitting in a predetermined relative rotated position thereof for preventing rotation of said collar on said box fitting.

4,043,576

THREADED PIPE COUPLING FOR SMOOTH PLASTIC JOINTS

Fritz Reich, Uhwiesen, and Ernesto Lehmann, Neuhausen, both of Switzerland, assignors to Georg Fischer Aktiengesellschaft, Switzerland

Filed Aug. 9, 1976, Ser. No. 712,768
Claims priority, application Switzerland, Aug. 27, 1975, 11125/75
Int. Cl.[2] F16L *21/06*
U.S. Cl. 285—322 **6 Claims**



1. A threaded coupling for smooth pipe comprising
a housing member for receiving one pipe end;
a sleeve nut threadedly engaging said housing, said nut having an inner conical surface,
said nut being axially movable relative to said housing upon relative rotation thereof between a disengaged position and a fully engaged position;
an elastomeric gasket within said housing;
a thrust ring axially adjacent said gasket; and
elastically deformable gripping means abutting said conical surface and said thrust ring for gripping said pipe;
said sleeve nut and said thrust ring having cooperative surfaces to cause axial movement of said thrust ring during a first portion of the axial movement of said sleeve nut from said disengaged position toward said engaged position, said axial movement of said thrust ring causing an axial force on said gasket;
said cooperative surfaces being disengaged at a predetermined axial force to subsequently permit radial deformation of said gripping means by said conical surface to grip said pipe.

4,043,577

SANDING DEVICE FOR INCREASED VEHICLE TRACTION

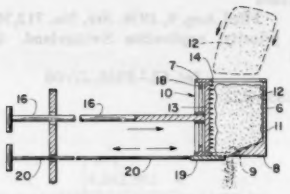
Robbie B. Nettles, Poulsbo, Wash., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Aug. 9, 1976, Ser. No. 712,475
Int. Cl.[2] B60B *39/06;* B61C *15/10*
U.S. Cl. 291—25 **1 Claim**

1. A vehicular accessory for an automotive vehicle having a cab, a chassis and a plurality of wheels rotatably mounted on the chassis, said vehicular accessory comprising
a box mounted on the chassis of a vehicle above and forward of a selected one of the wheels of the vehicle, said box having an open top, a bottom substantially parallel to the top and having an opening formed therethrough and two pairs of spaced parallel sides substantially perpendicular to the top and bottom, one of the sides being open, the top

admitting a bag of sand, ice-dissolving chemicals, and the like;

a side panel removably enclosing the open side of the box, said panel having a plurality of spikes extending from the inside surface thereof for puncturing a bag in the box and a control rod extending from the outside surface thereof to the cab of the vehicle to permit movement of said panel from within said cab; and



volume control means movably mounted at the bottom of the box and extending into the cab of the vehicle for controlling the volume of material passing from a bag in the box through the opening in the bottom of the box from the cab of the vehicle, said volume control means comprising a plate movably mounted over the opening in the bottom of the box for selectively uncovering a desired part of said opening and a control rod extending from the plate to the cab of the vehicle to permit movement of said plate from within said cab.

4,043,578

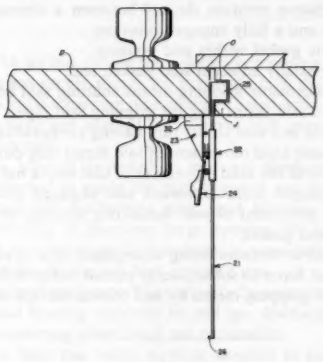
PORTABLE DOOR LOCK

Edgar S. Downs, 6530 Huntley Road, Worthington, Ohio 43085

Filed June 24, 1976, Ser. No. 699,476

Int. Cl.[2] E05C *19/18*

U.S. Cl. 292—290 **9 Claims**



1. A portable lock in the form of a single assembly comprising an elongated relatively thin guide strip adapted to be inserted between the edge of a door and its cooperating jamb and having a latch-engaging lug adjacent the forward end thereof for engaging a latch portion on the jamb when so inserted, a carriage slidably mounted on the strip for movement longitudinally thereof relative to said lug, a locking lever and a releasing lever pivotally mounted on the carriage in cooperative relationship, said locking lever being pivoted intermediate its ends about a pivot transversely of the carriage and the guide strip to provide a forward and rearward lever arm, a transversely disposed door-face-engaging portion on the forward end of the locking lever ahead of said transverse pivot and parallel thereto in the form of a yieldable pad, a transversely disposed restraining shoulder on the rear end of the locking lever behind said transverse pivot and parallel thereto on a member passing through the carriage into engagement with the adjacent face of the strip, a spring cooperating with said locking lever for normally biasing it about said transverse pivot to cause said shoulder to engage said strip face, said pad engaging the door face to yield to a limited extent when the strip is inserted in locking position between the door and jamb and the carriage is moved forward on the strip as far as possible, any opening pressure against the door tending to swing the locking lever about its pivot to increase the engagement of the shoulder with the strip face, said releasing lever being pivoted intermediate its ends about a pivot transversely of the carriage and the guide strip to provide a forward and rearward lever arm, said pivot being located behind and parallel to the pivot for the locking lever, the forward end of the releasing lever being positioned beneath the rear end of the locking lever so that pressure on the rear end of the releasing lever will pivot the locking lever forwardly to cause the pad to yield sufficiently to disengage the releasing shoulder from said strip face thereby permitting rearward sliding movement of the carriage and movement of the pad away from the door face.

4,043,579

ELASTOMERIC BUMPER SECURING PRESS FIT CLIP

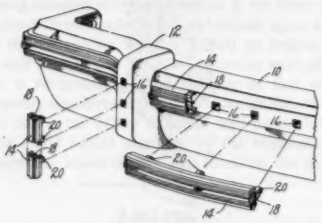
Engelbert A. Meyer, Bloomfield Hills, Mich., assignor to USM Corporation, Boston, Mass.

Continuation of Ser. No. 572,459, April 28, 1975, abandoned.

This application Apr. 6, 1976, Ser. No. 674,140

Int. Cl.[2] A44B *17/00, 21/00;* B60R *19/08;* F16B *13/04*

U.S. Cl. 293—71 R **3 Claims**



1. For securing a rib-carrying strip to an apertured member, the member being of material at least as hard as the material of the strip, a one-piece resilient sheet metal clip having opposed legs joined in a rounded nose portion receivable in the aperture of said member, the legs in localities nearer their free ends having inwardly projecting spaced prongs substantially directed toward said nose portion and engageable with opposite sides of the rib, the large intermediate said ends and the nose portion being bowed outwardly, and at least one pair of outwardly projecting prongs formed on the outwardmost intermediate bowed portions and substantially directed away from said nose portion whereby, upon engagement of the bowed portions with opposite walls of said aperture, the inwardly projecting prongs are yieldably urged together to bite into and grippingly engage said rib and the outwardly projecting prongs become embedded for securement in said walls to resist separation of the strip and the member.

4,043,580

CABLE-CONTROLLED GRAB DEVICE

Birger Hellmann Thaule, Risoy, Norway, assignor to A/S Kongshavn Industri, Alvoy, Norway

Filed June 17, 1976, Ser. No. 697,215

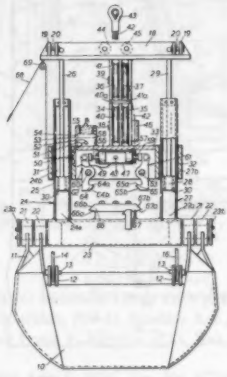
Claims priority, application Norway, June 20, 1975, 752193

Int. Cl.[2] B66C *3/10*

U.S. Cl. 294—70 **5 Claims**

1. In a cable-controlled grab device which comprises support yoke means, a pair of scoops directly and linkably con-

nected to said yoke means, a central shaft having said scoops pivotably mounted at opposite ends thereof, tackle means having upper and lower portions, said upper portion being secured to said yoke means and releaseable locking means arranged between said lower portion and said central shaft for indirectly connecting said scoops to said yoke means, said locking means comprising two locking arms urgeable by remotely controllable actuating means into a locking position in engagement with a locking member associated therewith, the



improvement consisting in actuating means in the form of a pressure medium cylinder linkably connected between said locking arms and inserted in a hydraulic circuit adapted to be pressure-loaded so as to force said locking arms into said locking position, remotely controllable valve means in said hydraulic circuit capable when closed of maintaining said arms in said locking position and when open of permitting said locking arms to slide out of engagement with said locking member due to the weight loading of said scoops.

4,043,581

SLING CONSTRUCTION

Dennis St. Germain, Aston, Pa., assignor to I & I Sling Co., Inc., Aston, Pa.

Filed Mar. 31, 1976, Ser. No. 672,470
Int. Cl.[2] B66C *1/18*
U.S. Cl. 294—74 **5 Claims**

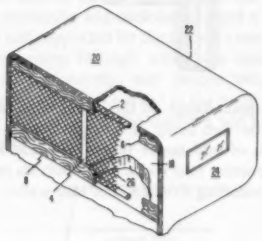
1. A sling for carrying loads which is made from a single length of cable, having ends thereof, which comprises: a body which includes three sections, loosely interwoven together, of said cable; a pair of loops formed from the cable, at each end of said body; wherein the loops of each pair are loosely woven together; wherein each pair of loops includes a first loop which is integrally connected to two of the three sections of cable forming said body and a closure loop; and wherein said closure loop is formed by the remaining section of the three sections of cable forming said body, doubled back upon, and secured to, itself only, by a metal sleeve which holds said end to said cable in a compressed relationship.

4,043,582

RESTRAINT DEVICE FOR RECREATIONAL VEHICLES

James T. Lyter, P.O. Box 724, Evergreen, Colo. 80439

Filed Nov. 17, 1975, Ser. No. 626,532
Int. Cl.[2] B62D *33/04*
U.S. Cl. 296—24 R **10 Claims**



1. A restraint device adapted to be positioned substantially completely across the open side of a compartment defined by a plurality of wall structures having upper, lower and side walls comprising:

a substantially flexible means having four end portions,

a first end portion affixed by a first securing means to one side wall structure,

a second end portion affixed by a second securing means to an upper wall structure permitting said flexible means to slide transverse of said compartment in a substantially perpendicular plane,

a third end portion affixed by a third securing means to a lower wall structure permitting said flexible means to slide transverse of said compartment in a substantially perpendicular plane,

a quick release means including a first quick release member integral with a fourth end portion of said flexible means and second quick release member integral with opposing wall structure normally cooperating in interlocking engagement to secure said flexible means to said wall structure in a closed position, said quick release means disengageable to permit separation whereby said quick release means is normally engaged to frustrate disengagement and opening of said flexible means by infants but is easily engageable by adults whereby forces received horizontal to said flexible means in preventing the occupant from being dislodged from said compartment are transmitted to said wall structures.

4,043,583

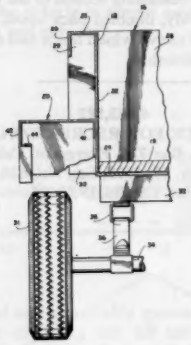
LIGHTWEIGHT TRAILER CONSTRUCTION

Carl E. Tidwell, Jr., 5858 Riverview Road, Mableton, Ga. 30059

Filed Apr. 8, 1976, Ser. No. 675,075
Int. Cl.[2] B62D *33/00*
U.S. Cl. 296—28 M **12 Claims**

1. A trailer having a vehicle body including a plurality of walls, said plurality of walls comprising a first side wall, a second side wall parallel to said first side wall and formed as a mirror image of said first side wall, and a front wall, said front wall extending from said first side wall to said second side wall,

each of said plurality of walls comprising a length of preformed member including a central web generally in the plane of the wall, a lower flange extending perpendicularly from the lower edge of said central web and inwardly of said vehicle



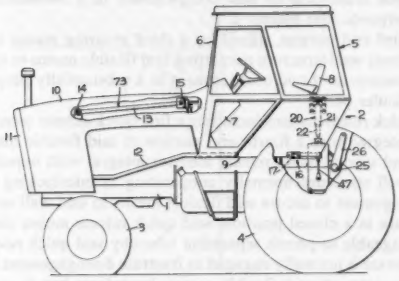
body, and an upper flange on the upper edge of said central web, said central web being of a height substantially greater than the width of said upper flange and said lower flange, means for supporting said walls, and a bottom resting on said lower flange extending from each of said walls.

4,043,584

VEHICLE SUSPENSION AND STABILIZER SYSTEM

Robert J. Wagner, and Ralph R. Atherton, both of Milwaukee, Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 17, 1975, Ser. No. 632,856
Int. Cl.² B62D *23/00*
U.S. Cl. 296—35 R **15 Claims**



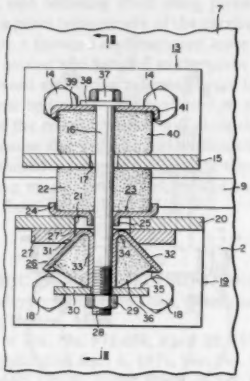
1. A tractor having a suspension system comprising, a tractor chassis mounted unsprung on the plurality of wheels, an operator station including means, resilient means mounted on said chassis supporting the operator station, a pitch and roll limiting mechanism connected between said operator station and vehicle chassis for limiting the pitch and the roll of the operator station, a stabilizer linkage means mounted on said vehicle chassis and pivotally connected to said operator station, said stabilizer linkage means including a pair of nonparallel links pivotally connected to said vehicle chassis, an arm pivotally connected to the opposite ends of said links, a pivotal connection pivotally connecting said arm to said operator station defining a pivotal axis, said stabilizer linkage means limiting the relative movement of said pivotal axis to essentially a vertical movement relative to said vehicle chassis as said operator station is moved relative to said vehicle chassis.

4,043,585

BUFFER FOR VEHICLE

Akira Yamanaka, Yokohama, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1976, Ser. No. 664,320
Claims priority, application Japan, Mar. 26, 1975, 50-41331; Oct. 22, 1975, 50-127805
Int. Cl.² B62D *23/00*
U.S. Cl. 296—35 R **12 Claims**



1. A buffer for normally preventing relative movement between a cab or body and a chassis frame of a vehicle, comprising a fixing member inserted through holes provided in flange portions of a first bracket fixed to said cab or rear body and of a second bracket fixed to said chassis frame, said fixing member being formed to fit loosely into at least one of said holes so as to tilt upon said relative movement, a buffer means being held on said fixing member and including a first buffer member provided between said flange portions of said first and second brackets and a second buffer member provided between one of said flange portions and either of a nut or a head of a bolt forming said fixing member, said first and second buffer members being passed through by said bolt, and a die having a die hole therein operatively positioned adjacent one of said buffer members, said first buffer member being made of resilient material, said second buffer member being plastically deformable and positioned adjacent said die hole to be pulled into the same upon the relative movement between said cab or body and said chassis frame by an impact force of more than a predetermined value applied to the vehicle.

4,043,586

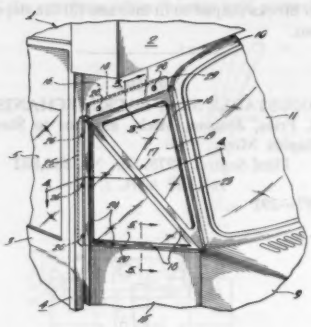
FLOATING WINDOW ASSEMBLY FOR VEHICLES

Paul R. Hafer, Boyertown, Pa., assignor to Boyertown Auto Body Works, Boyertown, Pa.

Filed Jan. 26, 1976, Ser. No. 652,509
Int. Cl.² B60J *1/10*
U.S. Cl. 296—84 C **2 Claims**

1. In a commercial vehicle such as a truck or a van the combination which comprises a chassis having a windshield, a non-integral body mounted on said chassis, a sub-assembly connecting the windshield to a transom on said body and a door post of said body, said sub-assembly having a frame, a relatively thick resilient seal in which the frame is mounted to provide a weather tight seal to permit limited relative movement of the frame, two transparent panes mounted in resilient

seals secured to the frame said frame being removably secured to the door post of the body and the transom by fastening



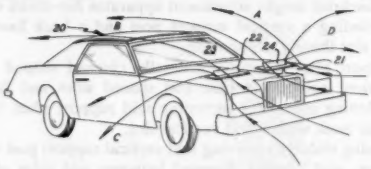
means clamping said frame to the door post and transom through strips of elastomeric material.

4,043,587

BUG DEFLECTING DEVICES

Michael A. Giallourakis, 509-11 Pinellas Ave., Tarpon Springs, Fla. 33589, and Louis F. Mlecka, P.O. Box 908, Brooksville, Fla. 33512

Filed Apr. 9, 1976, Ser. No. 675,571
Int. Cl.[2] B60J 1/20
U.S. Cl. 296—91 2 Claims



1. A deflecting device for deflecting air currents containing bugs, road grime and the like away from the windshield of a moving motor vehicle, said device adapted to be removably mountable at any position on the hood of any vehicle; said device comprising a generally vertically disposed transparent shield member and a horizontal base member; said shield member and base member being planar, flexible and semi-rigid; said base member comprising a pair of front and rear parallel, semi-rigid, flexible, strip permanent magnets and an upstanding member parallel to and disposed between said magnets and adjacent said rear magnet; said upstanding member having a front face canted backwardly; said shield member permanently secured to said front face of said upstanding member.

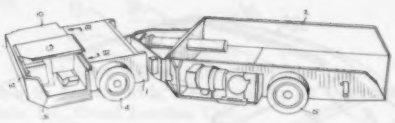
4,043,588

SHUTTLE CAR WITH OPERATOR PROTECTION

Paul F. Curry, Box 356, Raven, Va. 24639

Filed June 1, 1976, Ser. No. 691,485
Int. Cl.[2] B60J 7/00
U.S. Cl. 296—102 4 Claims

1. A mine shuttle car comprising a tractor, a load-carrying trailer, a swivel interconnecting the tractor and trailer, said swivel being positioned so that the tractor and trailer can each horizontally turn through a range of angularities relative to each other, front and rear sets of running wheels supporting the tractor and trailer respectively, each of said sets comprising two wheels only so that the tractor and trailer can each horizontally pivot on its set of wheels, reversible wheel power means for powering at least one of said sets, steering means for controlling said angularities to steer the shuttle car, said tractor and trailer having a low profile so the shuttle car can run forwardly and reversingly through a mine haulway and into and from a mine crossout, and said tractor having a substantially flat top through which from one side of the tractor an opening extends transversely from that side for a part of the tractor's width and below which the tractor forms a cockpit having controllers for at least said wheel power and steering



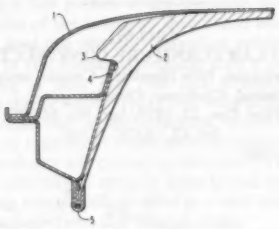
means and a support on which the operator can sit transversely on the tractor with at least his head above the tractor's top so he can look forwardly and backwardly, and a flat canopy for said opening and supported by the tractor's said top at a height forming open spaces through which the operator can look forwardly and backwardly, said canopy being horizontally movable transversely with respect to the tractor so as to cover and uncover said opening, the tractor's top and said canopy being made of steel plate.

4,043,589

AUTOMOTIVE VEHICLE-DOME

Franz-Werner Alfter, Siegburg; Hans-Ulrich Breitscheidel, and Heinz-Gerd Reinkemeyer, both of Troisdorf, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed Apr. 8, 1974, Ser. No. 459,181
Claims priority, application Germany, Apr. 7, 1973, 2317546
Int. Cl.[2] B60J 7/10
U.S. Cl. 296—137 A 13 Claims



1. An interior lining arrangement for vehicles having a roof structure, the arrangement comprising: means for mounting the interior lining in the vehicle including at least one mounting member secured to the roof structure, said mounting member terminating in a free end spaced from an inner surface of the roof structure to form between said free end and the roof structure at least one undercut portion disposed along at least a portion of at least one edge of the roof structure, a self-supporting lining means consisting of at least one panel of a cross-linked polyethelene foam, said lining means including at least one offset edge, and at least one outwardly extending elastically deformable clamping bead integrally formed along at least a portion of said at least one offset edge, said clamping bead including a lower surface overlying and extending beyond said free end of said mounting member, said lower surface of said at least one clamping bead engaging said free end of said at least one mounting member to clamp said self-supporting lining means in the vehicle in close proximity to the roof structure.

4,043,590

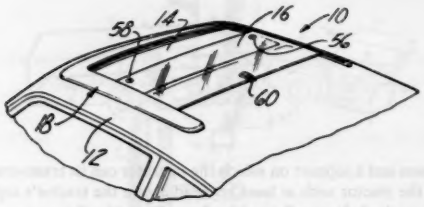
SLIDING ROOF ASSEMBLY

William J. Pizzuti, Bloomfield Hills, Mich., assignor to Skytrends, Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 540,727, Jan. 13, 1975. This application May 6, 1976, Ser. No. 683,769

Int. Cl.[2] B60J *7/10*

U.S. Cl. 296—137 H **6 Claims**



1. A sliding roof assembly for attachment to the top of a vehicle in proximity to an opening in the vehicle roof, the combination of; a frame member having a pair of longitudinally extending side members disposed at opposite sides of said opening and forward and rearward members disposed adjacent forward and rearward edges of said opening, said side members forming facing guide portions, a panel member mounted for sliding movement in said guide portions for movement between a forward position closing the opening in the vehicle roof to a rearward position in which said panel is disposed rearwardly of said opening, seal means mounted on said side and forward and rearward members for engagement with the underside of said panel when the latter is in its forward position, latch means associated with forward and rearward portions of said panel member and being operable to pull said panel member into sealing engagement with said seal member, said side members presenting rearward guide surfaces rearwardly of said rearward member elevated from said seal for engaging an underside of said panel upon rearward movement of the latter to raise said panel relative to said seal.

4,043,591

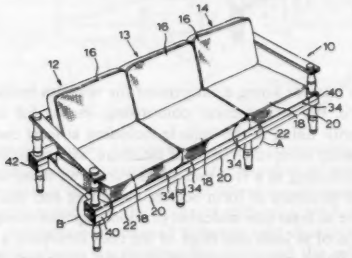
MODULAR FURNITURE CONSTRUCTION

Edmund J. Lehmann, New Hamburg, Canada, assignor to Electrohome Limited, Kitchener, Canada

Filed Dec. 22, 1975, Ser. No. 642,911

Int. Cl.[2] A47C *15/00*

U.S. Cl. 297—248 **6 Claims**



1. A modular furniture construction, comprising:

at least one seating module adapted for lateral alignment with others of its kind, each seating module including seat-support structure, back-support structure and leg means for supporting said structures above a floor;

each seat-support structure having, along one edge thereof adapted to be aligned with similar edges of other like modules, a horizontally elongated support member with a substantially rectangular transverse section, the support member having a downwardly facing stepped configuration at one end, and an upwardly facing stepped configuration at the other end; and

two filler blocks shaped to fit into and fill the stepped configurations.

4,043,592

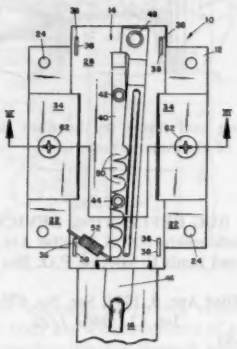
ADJUSTABLE SEAT BACK MECHANISM

Bernard J. Fries, Jenison, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Sept. 5, 1975, Ser. No. 610,832

Int. Cl.[2] A47C *3/00*

U.S. Cl. 297—291 **21 Claims**



1. A backrest height adjustment apparatus for chairs of the type including a vertical support post and a back having a vertical slot therein, comprising:

a support plate having a generally channel shaped cross section including a base and spaced sides and further including means for mounting said support plate to the chair back within said vertical slot;

a housing slidably receiving said vertical support post of the chair, said housing disposed between said sides of said support plate and including a channel shaped housing plate having spaced side portions;

latching means including a first member supported by said housing and a second member supported by said post for permitting stepwise, vertical adjustment of the housing and support plate relative to the vertical support post, one of said members being a pivotally mounted latch bar having a series of spaced recesses formed in the surface thereof along one lateral edge, the other of said members being a stud receivable within one of said spaced recesses:

means engaging said latch bar for biasing said latch bar against said stud; and

resilient means interconnecting said housing and said support plate for biasing said support plate to a vertical position and for permitting limited pivotal movement of said support plate relative to said housing.

4,043,593

VEHICLE SEATS

Harold Roy Turner, Sutton Coldfield, England, assignor to L.C.P. Group Services Limited, Brierley Hill, England

Filed Nov. 5, 1975, Ser. No. 629,097

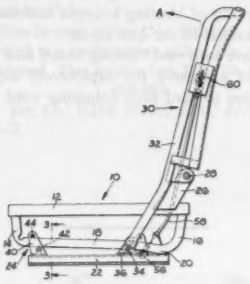
Claims priority, application United Kingdom, Nov. 9, 1974, 48613/74

Int. Cl.[2] A47C *1/02*

U.S. Cl. 297—341 **7 Claims**

1. A vehicle seat comprising a seat back pivoted intermediate its ends to a seat base, and further pivoted at its lower end below the seat base to the vehicle floor, in which the seat base is slidable forwardly and tipped when the seat back is pivoted

forward, and vice versa, characterized in that the seat base comprises a frame including at least one element in slidable engagement with a guide which is located on the floor adjacent the front of the seat base when the seat is in normal use posi-



tion, said guide including upper and lower guide elements which are spaced apart in the fore and aft direction, said frame element extending through the gap between said upper and lower guide elements, and said lower guide element being located nearer to said seat back than said upper guide element.

4,043,594

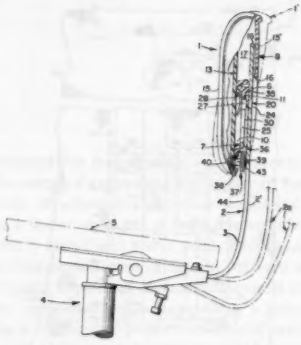
ADJUSTABLE CHAIR REST MEMBER

Douglas N. Cabell, Bloomfield Hills, Mich., assignor to GF Business Equipment, Inc., Youngstown, Ohio

Filed Mar. 12, 1976, Ser. No. 666,208

Int. Cl.[2] A47C *1/00*

U.S. Cl. 297—353 **10 Claims**



1. A chair including an upright back plate having an upper portion provided with a face and rear surface and a top edge, a rest member attached to said back plate upper portion and provided with means permitting both vertical and angular adjustment of said rest member relative said back plate upper portion, said rest member including a back frame provided with a central web including front and rear surfaces, said web having a vertical slot therethrough adapted to overlie said face of said back plate upper portion, said vertical adjustment means including a nut bracket adjustment assembly joining said back plate upper portion to said rest member central web, said nut bracket assembly provided with releasable fastener means carried by said back plate upper portion and projecting toward said web rear surface, mating fastener means disposed within said web slot and engaging said releasable fastener means, said mating fastener means including a pivotal member having a rear surface in overlying engagement with said web front surface, said pivotal member rear surface defining a convex surface when viewed in side elevation, said angular adjustment means including axially adjustable screw means carried by said rest member below said web slot and projecting rearwardly toward said back plate face to engage same, whereby vertical adjustment of said back rest is achieved by loosening said releasable fastening means to allow raising or lowering of said back rest as said mating fastener means is moved relative said web slot, and angular adjustment of said back rest is achieved by manipulating said screw means to axially displace same and cause tilting of said back rest about a horizontal axis passing through said back rest at a point above said mating fastener means.

4,043,595

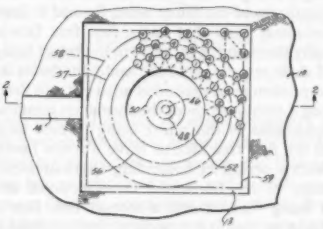
IN SITU RECOVERY OF SHALE OIL

Gordon B. French, Rifle, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation-in-part of Ser. No. 505,276, Sept. 12, 1974, abandoned, and Ser. No. 505,363, Sept. 12, 1974, and Ser. No. 505,457, Sept. 12, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,704

Int. Cl.[2] E21B *43/24, 43/26;* F21C *41/10*

U.S. Cl. 299—2 **111 Claims**



1. A method of recovering shale oil from an in situ oil shale retort in a subterranean formation containing oil shale, said retort having top, bottom, and side boundaries of the formation and containing fragmented formation containing oil shale therein, comprising the steps of:

excavating a first portion of the formation from within the boundaries of the in situ oil shale retort being formed to form at least one vertically extending columnar void, the surface of the formation defining such a columnar void providing at least one free face extending vertically through the formation within said boundaries, and leaving a second portion of said formation, which is to be fragmented by expansion toward such a columnar void, within said boundaries and extending away from a said free face;

forming a plurality of blasting holes in said second portion extending substantially parallel to a said free face;

loading explosive into said blasting holes;

detonating said explosive for explosively expanding said second portion toward said columnar void; and

retorting the fragmented formation containing oil shale in the in situ retort to recover shale oil and gaseous products therefrom.

24. A method of recovering shale oil from in situ oil shale retorts in a subterranean formation containing oil shale, said retorts having top, bottom and side boundaries of unfragmented formation and containing fragmented formation containing oil shale therein, comprising the steps of:

excavating first portions of the subterranean formation to form an access and perimetric tunnel system leading to individual retort sites;

excavating second portions of the subterranean formation at the individual retort sites to form a plurality of workrooms in communication with said tunnel system, arranged in rows and columns, the floor plan of such workrooms having dimensions approximating the dimensions of the retorts to be built using such workrooms;

excavating a third portion of the formation from within the boundaries of the in situ oil shale retorts being formed to

form at least one vertically extending columnar void in each such retort being formed, the surface of the formation defining the columnar void providing at least one free face extending vertically through the formation within said boundaries, and leaving a fourth portion of said formation, which is to be fragmented by expansion towards said columnar void, within said boundaries and extending away from a said free face;

explosively expanding said fourth portion toward said columnar void in a single round of explosions in one or more segments, including at least one layer of formation parallel to a said free face to fragment said fourth portion and to fill with fragmented formation containing oil shale said columnar void and the space occupied by said fourth portion prior to the expansion;

retorting the fragmented formation containing oil shale in the retort by passing a retorting fluid therethrough; and

removing the retorting products from the bottom of the respective retorts.

66. The method of forming, in a subterranean formation containing oil shale, an in situ oil shale retort having boundaries of unfragmented formation and containing fragmented oil shale therein, comprising the steps of:

excavating a first portion of the formation contained within the boundaries of the retort being formed to leave at least one columnar void that has a first free face extending vertically through the oil shale in the retort being formed, the oil shale remaining within said boundaries including a second portion to be expanded adjacent said first free face;

excavating a third portion of the formation contained within the boundaries of the retort being formed adjacent one end of the first free face to leave a room having a floor plan with a perimeter coinciding approximately with the perimeter of the horizontal cross-sectional area of the retort being formed and a second free face extending transverse to the first free face, the oil shale remaining within said boundaries including a fourth portion to be expanded adjacent said second free face;

explosively expanding the second portion toward said first free face in a single round in one or more layers parallel to said first free face to fragment the second portion; and

explosively expanding the fourth portion toward said second free face in a single round to fragment said fourth portion.

4,043,596

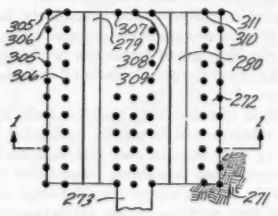
FORMING SHALE OIL RECOVERY RETORT BY BLASTING INTO SLOT-SHAPED COLUMNER VOID

Richard D. Ridley, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Aug. 11, 1975, Ser. No. 603,705

Int. Cl.[2] E21C *41/10*

U.S. Cl. 299—2 **51 Claims**



1. A method of forming an in situ oil shale retort in a subterranean formation containing oil shale, said retort having top, bottom and side boundaries of the formation and containing fragmented formation containing oil shale therein, comprising the steps of:

excavating a first portion of the formation from within the boundaries of the in situ oil shale retort being formed to form at least one vertically extending slot-shaped columnar void, the surfaces of the formation defining such a columnar void providing at least a pair of parallel planar free faces extending vertically through the oil shale formation within said boundaries, and leaving a second portion of said formation which is adjacent the free faces and within the boundaries of the retort being formed;

forming a plurality of blasting holes in said second portion extending parallel to the free faces;

loading explosive into said blasting holes; and

detonating said explosive for explosively expanding said second portion toward such columnar void.

4,043,597

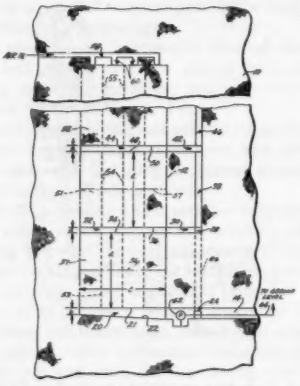
MULTIPLE LEVEL PREPARATION OF OIL SHALE RETORT

Gordon B. French, Bakersfield, Calif., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation-in-part of Ser. No. 602,929, Aug. 8, 1975, abandoned, which is a continuation of Ser. No. 464,957, April 29, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,699

Int. Cl.[2] E21B *43/24, 43/26;* E21C *41/10*

U.S. Cl. 299—2 **31 Claims**



19. A method of forming an in situ oil shale retort containing a fragmented permeable mass of oil shale particles in a subterranean deposit, which comprises the steps of:

excavating a plurality of vertically spaced apart voids with a zone of unfragmented deposit between adjacent voids and within the boundaries of the in situ oil shale retort being formed;

explosively expanding at least one lower portion of such an unfragmented zone downwardly toward a lower void; and

thereafter explosively expanding an upper remaining portion of such an unfragmented zone at least partly toward an upper void to form a fragmented permeable mass of particles within the boundaries of the in situ oil shale retort being formed, wherein the void volume of the fragmented permeable mass of particles in the in situ oil shale retort is substantially equal to the total volume of the voids within the boundaries of the in situ oil shale retort being formed.

4,043,598

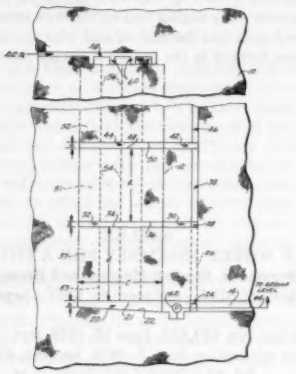
MULTIPLE ZONE PREPARATION OF OIL SHALE RETORT

Gordon B. French, Bakersfield, and Donald E. Garrett, Claremont, both of Calif., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation-in-part of Ser. No. 602,930, Aug. 8, 1975, abandoned, which is a continuation of Ser. No. 464,956, Aug. 29, 1974, abandoned. This application Feb. 20, 1976, Ser. No. 659,899

Int. Cl.[2] E21B *43/26*; E21C *41/10*

U.S. Cl. 299—2 71 Claims



1. A method for fragmenting a subterranean deposit comprising the steps of excavating a plurality of vertically spaced apart voids of substantially similar horizontal cross section including a lower void and at least one void located substantially directly above said lower void, thereby leaving an intervening unfragmented zone of deposit between adjacent voids, and explosively expanding each unfragmented zone toward the previously excavated voids to produce a subterranean room containing a fragmented permeable mass of particles having an average void volume substantially equal to the total volume of the voids by detonating explosive in each unfragmented zone between adjacent voids and located sufficiently close to the free face between the unfragmented zone and adjacent voids to expand the unfragmented zone toward each void.

42. A method of recovering shale oil from a subterranean oil shale deposit which comprises the steps of:

excavating a plurality of vertically spaced apart voids with a zone of unfragmented deposit between adjacent vertically spaced apart voids wherein the horizontal cross section of each void is substantially similar to the horizontal cross section of the in situ oil shale retort being formed;

explosively expanding such an unfragmented zone between adjacent vertically spaced apart voids and oil shale above the top void toward the voids to form a fragmented permeable mass of particles in an in situ oil shale retort being formed;

supplying gas to the top of the fragmented permeable mass for establishing a retorting zone in the fragmented permeable mass and a downward flow of hot gas through the retorting zone; and

recovering shale oil produced in the in situ oil shale retort.

4,043,599

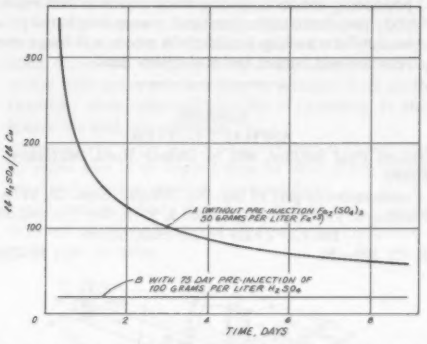
ACID PREINJECTION TO DECREASE INSTANTANEOUS ACID CONSUMPTION IN IN-SITU MINING

Peter James Lingane, Concord; Lawrence MacLagan Cathles, III, Cambridge, and Limin Hsueh, Bedford, all of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Oct. 17, 1975, Ser. No. 623,429

Int. Cl.[2] E21B *43/28*

U.S. Cl. 299—4 17 Claims



1. In in-situ solution mining for metal values in a deep lying deposit, the process comprising sinking at least one hole in said deposit, injecting an oxidant containing acid lixiviant for said metal values into at least one hole in said deposit, and recovering a pregnant lixiviant containing metal values from at least one of said holes, the improvement comprising, prior to the injection of said lixiviant, injecting an acid solution into said deposit for pre-reaction with acid neutralizing minerals in said deposit and maintaining said acid solution in contact with said deposit for a sufficient period of time to stabilize a leached metal response into said deposit to said lixiviant.

4,043,600

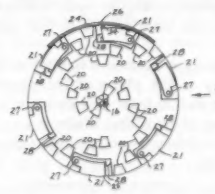
ADJUSTABLE BUCKET FOR AN EARTH BORING MACHINE

Norman Dean Dyer, Beaumont, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 615,319, Sept. 22, 1975, abandoned, which is a continuation of Ser. No. 465,192, April 29, 1974, abandoned. This application Oct. 18, 1976, Ser. No. 733,483

Int. Cl.[2] E21D *9/08*

U.S. Cl. 299—33 3 Claims



1. An earth boring machine for producing a bore by loosening material at the face of the bore wherein the loosened material falls to the bottom of the bore, comprising:

a machine body;

a rotary head connected to said machine body, said rotary head having a central axis;

cutter means on said rotary head for loosening material at the face of the bore;

a shield positioned over said machine body extending proxi-

mate said rotary head, said shield located at a first radial distance from the central axis of said rotary head;

at least one bucket connected to said rotary head for picking up the loosened material at the bottom of the bore; and

positioning means for positioning said bucket substantially at said first radial distance from the central axis of said rotary head when said bucket is in a first position picking up the loosened material at the bottom of the bore and for positioning said bucket at a second and shorter radial distance from the central axis of said rotary head when said bucket is in a second position spaced from said first position, said positioning means including track means in said machine body proximate said cutterhead, means connected to said bucket for traveling in said track means and hinge means between said bucket and said rotary head.

4,043,601

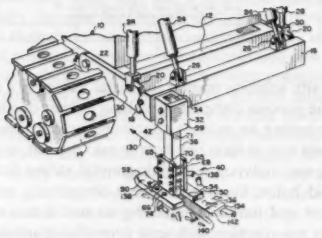
ASPHALT CUTTER

Raymond Paul Schiller, 905 N. Draper Road, McHenry, Ill. 60050

Continuation-in-part of Ser. No. 509,093, Sept. 25, 1974, abandoned. This application Mar. 1, 1976, Ser. No. 662,545

Int. Cl.[2] E02D *17/13;* E01C *23/09*

U.S. Cl. 299—36 **18 Claims**



1. A cutter head for a cutting device for forming a narrow trench in a layer of asphalt-like material along a straight or curved path of travel comprising:

a lifter blade having an approximately flat upper surface engageable under and against said layer and extending, in use, at an angle downwardly in the direction of the path of travel;

said lifter blade having essentially vertical planar opposite side walls extending in the direction of the path of travel and intersecting with said flat upper surface at approximately right angles to define a pair of laterally spaced cutting edges;

a flat keeper member rigidly mounted on each side of said lifter blade;

said keeper members presenting essentially co-planar flat under surfaces intersecting with said upper surface of said lifter blade and positionable in use upon the top of said layer;

each of said keeper members having an inner cutting edge substantially in the plane of the associated side of said lifter blade and at least co-extensive with the associated cutting edge of said lifter blade;

and means for drivingly mounting said cutter head upon a prime mover.

4,043,602

METHOD AND APPARATUS FOR CONSTRUCTING A MOP

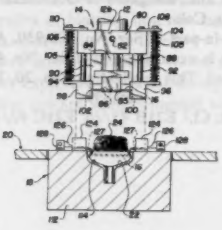
Audrey H. Ballew, Sweetwater, Tex., assignor to Dallas County Association for the Blind, Dallas, Tex.

Filed Apr. 27, 1976, Ser. No. 680,964

Int. Cl.[2] A46D *3/04*

U.S. Cl. 300—16 **15 Claims**

1. Apparatus for assembling a mop head comprising: support means arranged to support a mop head having cavity formed therein, said cavity having opposed shoulders in the outer end thereof, ram; support means arranged to support the ram, means to slideably support said ram; ram; a ram head adapted



to disengageably hold a spring wire; actuating means to urge said ram downwardly urging said spring wire into the cavity of the mop head such that the ends of said wire are engaged under the shoulders formed in the cavity to retain the wire therein.

4,043,603

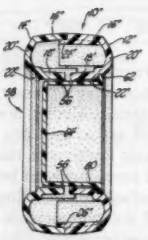
VEHICLE WHEEL ASSEMBLY FOR A TOY VEHICLE

Henry F. Bergmann, Sterling Heights, and Bernard J. Oswald, Fraser, both of Mich., assignors to AMT Corporation, Troy, Mich.

Division of Ser. No. 587,423, June 16, 1975, Pat. No. 3,985,392. This application June 1, 1976, Ser. No. 691,563

Int. Cl.[2] B60B *5/02;* B60C *7/24*

U.S. Cl. 301—63 PW **6 Claims**



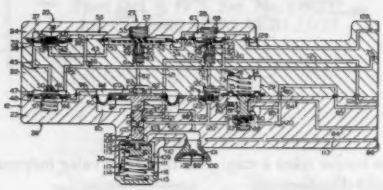
1. A vehicle wheel assembly for a toy vehicle comprising: a substantially hollow tire portion including two structurally identical mating shells made of a relatively rigid plastic material, each of said shells including an outer annular wall, an inner annular wall generally concentric with said outer annular wall, and a side wall joining said outer and inner annular walls along their exterior edges, said shells including means for facilitating mutual alignment and support thereof and being in mating engagement along the outer peripheral center line of said tire portion; a wheel portion for receiving said tire portion; and retaining means for retaining said shell members in mating engagement on said wheel portion, said retaining means including a retainer lip extending generally radially inwardly from said inner annular walls of said mating shells for frictionally engaging said wheel portion; said wheel portion including a substantially cylindrical portion for receiving said shells and a flange extending radially from one end of said cylindrical portion for engaging one of said shells; the outer diameter of said cylindrical portion being slightly greater than the inner diameter of said retainer lip.

4,043,604

EMERGENCY PORTION FOR A BRAKE CONTROL VALVE

James E. Hart, Trafford, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Nov. 11, 1976, Ser. No. 740,837
Int. Cl.[2] B60T *15/18*
U.S. Cl. 303—33 10 Claims



1. For use in a brake apparatus including a brake pipe, a quick action chamber, an auxiliary reservoir and an emergency reservoir each normally charged to a certain chosen pressure, a brake cylinder and a fluid-pressure-operated service valve device, a fluid-pressure-operated emergency valve device operative in conjunction with said service valve device in response to a reduction of the pressure in the brake pipe at an emergency rate to effect the supply of fluid under pressure from said reservoirs to said brake cylinder to cause an emergency brake application, said emergency valve device comprising:

a. a first restricted means enabling flow of fluid under pressure between the brake pipe and the quick action chamber to provide for charging the quick action chamber from the brake pipe, wherein the improvement comprises:

b. a second restricted means enabling flow of fluid under pressure between the brake pipe and the quick action chamber, said second means being so arranged with respect to said first means as to enable parallel flow of fluid under pressure between the quick action chamber and the brake pipe via said first and second restricted means,

c. a valve seat interposed between said first and second restricted means, and

d. a resilient valve member subject on its respective opposite sides to the pressure of the fluid in the brake pipe and in the quick action chamber and having said first restricted means so mounted thereon that, upon movement of said member into engagement with said valve seat in response to the pressure in the brake pipe exceeding that in the quick action chamber, flow of fluid under pressure between the brake pipe and the quick action chamber via said second restricted means is cut off so that, so long as the pressure in the brake pipe exceeds that in the quick action chamber, flow of fluid under pressure from the brake pipe to the quick action chamber is only via said first restricted means, said resilient valve member being movable out of engagement with said valve seat in response to equalization of the pressures on the respective opposite sides thereof thereby enabling flow of fluid under pressure from the quick action chamber to the brake pipe via said first and second restricted means in parallel in response to a reduction of pressure in the brake pipe.

4,043,605

EMERGENCY PORTION FOR A BRAKE CONTROL VALVE

James E. Hart, Trafford, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

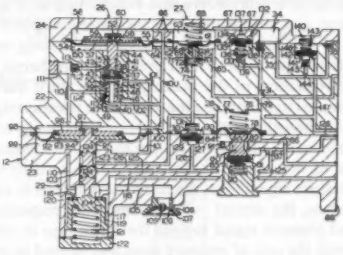
Filed Jan. 10, 1977, Ser. No. 758,046
Int. Cl.[2] B60T *15/30*
U.S. Cl. 303—37 10 Claims

1. For use in a brake apparatus including a brake pipe, an auxiliary reservoir and an emergency reservoir each normally charged to a certain chosen pressure, a brake cylinder and a fluid-pressure-operated service valve device, a fluid-pressure operated emergency valve device operative in conjunction with said service valve device in response to a reduction of the pressure in the brake pipe at an emergency rate to effect the supply of fluid under pressure from said reservoirs to said brake cylinder to cause an emergency brake application and comprising:

a. a casing having therein a plurality of chambers, bores and passageways, one of said bores connecting a pair of said chambers and having an annular valve seat at one end and a pair of passageways opening at one end into said bore and one of said pair of chambers respectively and cooperating therewith to provide a communication through which fluid under pressure may be released from another chamber, other than said plurality of chambers, to atmosphere via said one chamber,

b. a poppet-type valve which so cooperates with said annular valve seat as to control flow of fluid under pressure from said another chamber to atmosphere,

c. choke means enabling the release of fluid under pressure from said another chamber at a service rate of reduction of brake pipe pressure,



d. a movable abutment subject on its respective opposite sides to the pressure in said another chamber and the brake pipe,

e. fluid-pressure-operated combined emergency and brake pipe vent valve means for effecting the supply of fluid under pressure from the emergency reservoir to the brake cylinder and the release of fluid under pressure from the brake pipe at an emergency rate, and

f. means enabling said movable abutment to so control operation of said poppet-type valve in response to a reduction of pressure in the brake pipe at a service rate as to effect the release of fluid under pressure from said another chamber to atmosphere via said choke means at said service rate without effecting operation of said combined emergency and brake pipe vent valve means, and in response to a reduction of pressure in the brake pipe at an emergency rate to cut off the release of fluid under pressure from said another chamber to atmosphere and effect operation of said combined emergency and brake pipe vent valve means to release fluid under pressure from the brake pipe at an emergency rate and supply fluid under pressure from the emergency reservoir to the brake cylinder to cause an emergency brake application.

4,043,606

RAIL VEHICLE BRAKE PIPE VALVE ARRANGEMENT HAVING A FLUID PRESSURE DROP DETECTOR AND A VENT VALVE CONTROLLED THEREBY FOR BRAKE PIPE PRESSURE GRADIENT REDUCTION

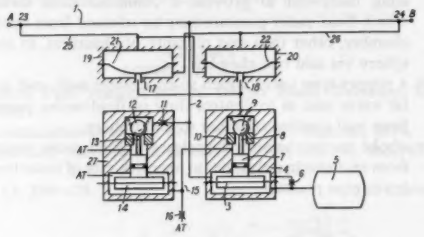
David John Wickham, London, England, assignor to Westinghouse Brake & Signal Co. Ltd., Chippenham, England

Continuation-in-part of Ser. No. 513,398, Oct. 9, 1977, Pat. No. 3,966,272. This application Mar. 8, 1976, Ser. No. 664,873

Claims priority, application United Kingdom, Mar. 27, 1975, 13016/75

Int. Cl.² B60T *17/04*

U.S. Cl. 303—82 **8 Claims**



1. A rail vehicle brake pipe pressure gradient reducing valve arrangement comprising a first valve means functioning as a brake pipe fluid pressure-drop detector, a second valve means in the form of a relay valve and functioning as a brake pipe vent valve, and a third valve means functioning as a pressure signal deriving means, the first valve means being coupled to the brake pipe to sense a fluid pressure-drop therein due to a pressure reduction in the brake pipe, the third valve means being coupled to the brake pipe to derive a pressure signal from fluid flow therealong, the first valve means being coupled to the second valve means and to the third valve means so as in response to the sensed fluid-pressure drop to deliver the derived pressure signal from the third valve means to the second valve means, the second valve means being responsive to the delivered pressure signal to vent the brake pipe to atmosphere to augment the rate of pressure drop and to tend to reduce the pressure gradient therein, venting operation of the second valve means being inhibited by the first valve means sensing a steady pressure when a steady pressure gradient exists such as may be caused by leakage from the brake pipe or by sensing a rising pressure during re-charging of the brake pipe, venting operation of the second valve means also being inhibited by the third valve means being responsive to absence of a pressure gradient along the brake pipe to derive a zero pressure signal.

4,043,607

METHOD AND DEVICE FOR CONTROLLING DISC BRAKES

Louis Signorelli, and Alain Yves Louis Marcel Geoffroy, both of Toulouse, France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Jan. 28, 1976, Ser. No. 652,990

Claims priority, application France, Feb. 7, 1975, 75.03835; Mar. 24, 1975, 75.09038

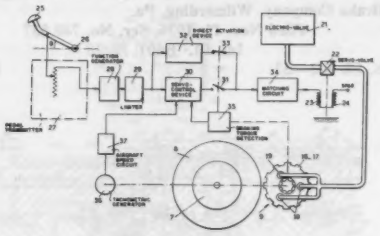
Int. Cl.² B60T *8/02*

U.S. Cl. 303—100 **10 Claims**

1. A method for controlling a hydraulic disc brake, particularly for aircraft, said brake being associated with at least one wheel and actuated by a mobile member, comprising the following steps:

detecting the braking torque actually exerted on the wheel;

servo-controlling said actual braking torque by a reference braking torque such that a predetermined value of said reference torque corresponds to a determined displacement of said mobile member, the value of the reference torque increasing with the displacement of said mobile member up to a certain position, beyond which the reference torque takes a maximum threshold value indpendent of said displacement.



4,043,608

BRAKE FORCE CONTROL DEVICE FOR BACK-CONTROL

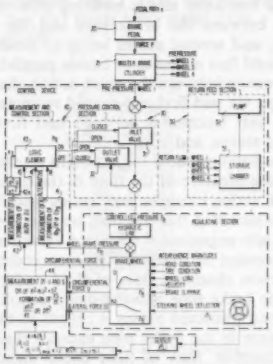
Guillaume Bourg, Karlsruhe; Hubertus Christ, Stuttgart; Taddäus Hausmann, Worth, and Louis Sales, Blankenloch, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Continuation of Ser. No. 280,189, Aug. 14, 1972, abandoned. This application Mar. 4, 1976, Ser. No. 664,031

Claims priority, application Germany, Aug. 13, 1971, 2140658

Int. Cl.² B60T *8/08*

U.S. Cl. 303—104 **21 Claims**



1. A brake force control device for vehicles with a back-control means reducing the brake pressure of the pressure control medium upon exceeding a maximum force acting at a wheel and with disengagement of the back-control means with a re-decreasing force after re-passing through the maximum value, characterized by further means for controlling the engagement and disengagement of said back-control means by signals including signal producing means for forming said signals, taking into consideration the hysteresis effect of the control operation, by the signs of the derivatives with respect to time of the force acting on the wheel and of the brake pressure, and characterized in that the back-control means causing a reduction of the brake pressure is initiated with an increasing brake pressure and a decreasing wheel force only if prior thereto both wheel force and brake pressure increased, and is turned-off with a decreasing brake pressure and a de-

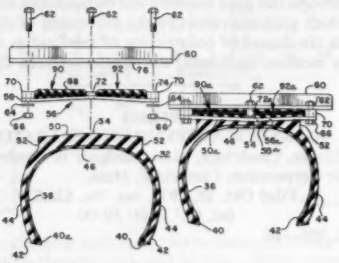
creasing wheel force only if prior thereto the wheel force increased with a decreasing brake pressure.

4,043,609

ARMORED TIRE HAVING A FLEXIBLE TAPERED BELT ARRANGEMENT

Aleksandar Vidakovic, Libertyville, and Karl Salna, Mundelein, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Oct. 6, 1975, Ser. No. 619,757
Int. Cl.[2] B60C *27/20*; B62D *55/28*
U.S. Cl. 305—19 **6 Claims**



1. An armored peripheral track comprising:

first and second inextensible belts each having a first elastomer layer tapered in cross section from a first edge thereof to a second edge thereof; a first textile fabric breaker ply positioned on said first elastomer layer; an inextensible filament ply constructed of cables insulated in elastomer, said cables disposed longitudinally, spirally and circumferentially to present an endless ply; a second textile fabric breaker ply positioned on said inextensible filament ply; a cap of elastomer positioned on said second textile ply and presenting an outside diameter of said belts;

a plurality of anchor plates disposed circumferentially around the inside diameter of said first and said second tapered inextensible belts at spaced apart intervals, transversely oriented to said belts, said anchor plates being formed with channel portions to conform to and preserve said tapered cross section of said first and said second belts, said anchor plates further equipped with end spacers having apertures and center spacers being tapped;

a plurality of traction plates having a plurality of apertures, disposed circumferentially around the outside diameter of said first and said second tapered inextensible belts in an orientation transverse thereto at spaced apart intervals corresponding to the stated location of said anchor plates;

fastening means passing through said apertures in said anchor plates and said apertures in said traction plates for forming a couple therebetween which compresses said first and said second belts and provides, through the location of said traction plates, an armored peripheral track surface on the outside diameter of said belts and an interrupted surface on the inside diameter of said belts through the location of said anchor plates.

4,043,610

TRACK SHOE

Rudolph Halmosi, Hudson; Karl W. Schneider, Parma, and John F. Weidman, Willoughby Hills, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 23, 1976, Ser. No. 716,520
Int. Cl.[2] B62D *55/28*
U.S. Cl. 305—19 **3 Claims**

1. A ground engaging shoe for a cushioned track, said shoe comprising a flat base plate having a front edge, rear edge, and a pair of side edges, a V-shaped main grouser with the apex thereof located at the center of said plate adjacent the front edge and with each arm thereof extending rearwardly and terminating adjacent to said rear edge, a pair of identical secondary grousers located on the opposite sides of the main grouser adjacent said front edge, each of said secondary grousers having a pair of end portions interconnected by an intermediate portion that is substantially parallel to the adjacent arm of the main grouser and cooperates therewith for resisting lateral slippage of said shoe when engaging the ground, and a stub

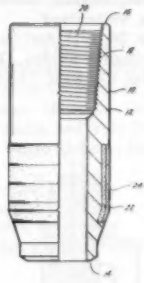
grouser located at said center of said plate adjacent said rear edge, said stub grouser having a V-shaped main body portion and having the ends thereof terminating with a pair of end portions which are adjacent to said rear edge, each of said grousers being of a uniform height and having the top surfaces thereof lying in a plane parallel to the plane of the base plate when viewed from the front edge and being curved when viewed from either of the side edges.

4,043,611

HARD SURFACED WELL TOOL AND METHOD OF MAKING SAME

Duane W. Wallace, Houston, Tex., assignor to Reed Tool Company, Houston, Tex.

Filed Feb. 27, 1976, Ser. No. 661,900
Int. Cl.[2] F16C *29/00*
U.S. Cl. 308—4 A **3 Claims**



1. A tool joint comprising

a tubular body,

at least one band of coarse-grained hard metal in an alloy steel matrix extending circumferentially around the exterior of said tubular body, and

a continuous fine-grained cast tungsten carbide layer deposited to cover substantially all of said band.

4,043,612

BEARING STRUCTURE

Frederic K. Orcutt, San Jose, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed June 6, 1975, Ser. No. 584,270
Int. Cl.[2] F16C *7/04, 35/00*
U.S. Cl. 308—9 **10 Claims**

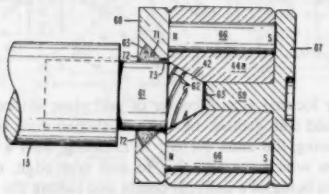
1. A bearing structure for a pair of relatively moving elements, characterized in that:

a magnetic lubricant is disposed between said elements; and

magnetic means are provided for retaining said lubricant between said pair of elements;

said magnetic means including means for establishing opposite magnetic polarities in at least two portions of said structure, said portions having confronting faces defining a primary magnetic air gap flux path therebetween for focussing said magnetic fluid between said elements;

said faces being inclined divergingly with respect to one another, adjacent said primary magnetic air gap flux path, to define a secondary magnetic air gap flux path serving as a reservoir, for receiving excess magnetic lubricant from said primary air gap when the volume defined between



said elements decreases or the volume of said lubricant increases, and for supplying magnetic lubricant to said primary air gap when the volume defined between said elements increases or the volume of said lubricant decreases; and

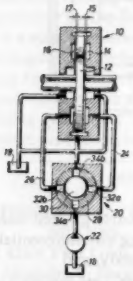
at least one of said elements is formed with pumping grooves for receiving magnetic lubricant from at least said secondary reservoir air gap and for pressurizing and distributing said lubricant between said elements during relative movement of the elements.

4,043,613

HYDROSTATIC BEARING

Lennart Werner Freese, Jarfalla, Sweden, assignor to New-Invent S.A., Geneva, Switzerland

Filed Sept. 26, 1975, Ser. No. 617,028
Claims priority, application Sweden, Oct. 4, 1974, 7412540
Int. Cl.[2] F16C *32/06*
U.S. Cl. 308—9 **11 Claims**



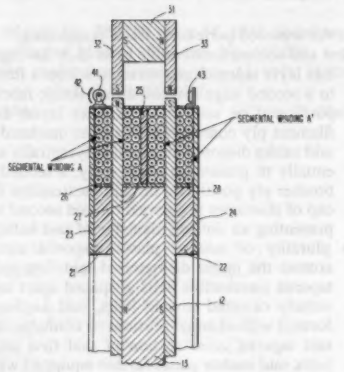
1. A hydrostatic bearing having at least one pair of bearing pockets formed between the coacting surfaces of the bearing and which are supplied with pressure fluid from a pressure source to develop a counteracting pressure to the bearing load in a manner known per se, wherein the bearing pockets are supplied with pressure fluid through a valve means for throttling and distributing the fluid, the valve means being adapted to distribute, under constriction, the pressure fluid from the pressure source between the pockets in such a way that the valve means (1) reduces its throttling effect on the flow to a pocket if the pressure caused by the bearing load in this pocket rises and (2) increases its throttling effect on the flow to a pocket if the pressure caused by the bearing load in this pocket decreases, comprising the improvement wherein the valve means includes a valve element in the shape of a cylindrical body or roller which is accomodated freely movable in a cylindrical valve chamber, the diameter of which somewhat exceeds that of the element, so that a clearance or gap is formed between the element and the chamber wall, in which the chamber has a set of four openings for coacting with the valve element, which is arranged to cover the openings to a varying degree with its curved surface, two opposing openings forming bearing ports each in communication with a bearing pocket while the two remaining openings form a pressure port and an outflow port respectively in communication with the pressure source and a low pressure area such as an outflow or a sump, so that the pressure fluid from the pressure port is distributed on either side of the valve element to the bearing ports through the gaps between the element and the chamber wall, which gaps are varied by the movement of the element, and thus the degree of constriction of the fluid as well as the pressure medium itself being distributed between the pockets.

4,043,614

MAGNETIC SUSPENSION APPARATUS

Frank Lyman, Cambridge, Mass., assignor to Cambridge Thermionic Corporation, Cambridge, Mass.

Filed Oct. 28, 1975, Ser. No. 626,527
Int. Cl.[2] F16C *39/00*
U.S. Cl. 308—10 **12 Claims**



1. Magnetic suspension apparatus comprising a wafer-like stator portion surrounded by a rotor portion,

said stator portion comprising:

two permeable discs and a permanent magnet therebetween,

said permanent magnet having a diameter substantially greater than its thickness and being polarized axially whereby one face is its north pole and the opposite face is its south pole,

said stator portion further including a plurality of sectoral windings in the peripheral regions of each of said permeable discs for inducing magnetic flux in respective sectors of each disc directed radially inwardly or radially outwardly accordingly as electric current is caused to flow in one direction or the opposite direction in a set of sectoral windings;

said rotor portion comprising:

means defining two inwardly-directed narrow annular pole faces spaced from each other in accordance with the spacing between the two permeable discs of the stator,

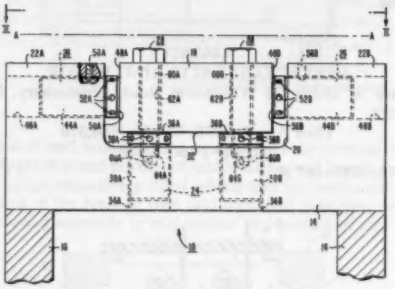
said pole faces being of greater radius than the radius of the permeable discs of the stator whereby they provide the necessary magnetic gap,

said annular pole faces being included in a magnetic flux path in the rotor which is directed outwardly from one annular pole face, thence axially, and thence inwardly to the other annular pole face.

4,043,615
THRUST BEARING LOCATING DEVICE AND A METHOD FOR LOCATING A THRUST BEARING WITHIN A TURBINE CASING

Lewis J. Miller, Nether Providence, and Casimir M. Klarman, Folsom, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 7, 1975, Ser. No. 620,440
Int. Cl.² F16C *23/00*
U.S. Cl. 308—32 **3 Claims**



1. In an axial flow turbine apparatus having a casing with an axis extending therethrough and having a rotor mounted for rotation therewithin, a thrust bearing member supporting said rotor in a position within said casing, wherein the improvement comprises a device for positioning said thrust bearing within said casing, said device comprising;

a first pair of threaded bolts displaceably mounted, one bolt of said first pair on each side of said axis, within said casing, said first bolts bearing against and engaging opposite sides of said bearing member and having access means on said first bolts for displacing said bolts relative to said casing to vary the transverse location of said bearing relative to said axis;

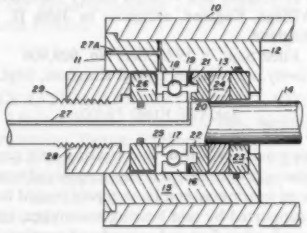
a second pair of bolts displaceably mounted, one bolt of said second pair on each side of said axis, within said casing, said second bolts bearing against and engaging opposite sides of said bearing member and having access means on said second bolts for displacing said second bolts relative to said casing to vary the axial location of said bearing relative to said casing; and

a third pair of bolts one bolt of said third pair on each side of said axis, said third bolts passing through said bearing member and being threaded into said first bolts to secure said bearing in an adjusted axial and transverse position and to lock said first bolts and said bearing in place within said casing.

4,043,616
BEARING CARTRIDGE ASSEMBLY

Aaron Zimmer, 6476 Monitor St., Pittsburgh, Pa. 15217

Filed May 27, 1976, Ser. No. 690,416
Int. Cl.² F16C *33/82*
U.S. Cl. 308—36.3 **15 Claims**

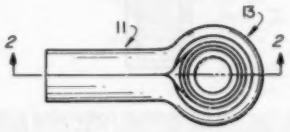


1. A bearing for conveyor roils or the like adapted to fit within a conveyor roll shell comprising coaxial inner and outer bearing elements spaced apart to provide a bearing cavity between their bearing surfaces, a fluid lubricant containing particles of magnetizable material disposed in the bearing cavity, and permanent magnet lubricating means disposed adjacent the bearing elements but separate therefrom and outside the bearing cavity to establish flux paths between the bearing elements and across the bearing cavity so as to distribute the lubricant uniformly over the bearing surfaces within the bearing cavity by magnetic attraction of the lubricant.

4,043,617
SELF-ALIGNING BEARING AND ROD END ASSEMBLY INCLUDING FORMED BALL MOUNT

Earl S. Cain, Portola Valley; Jerome A. Carlson, Woodside, and George E. Goodrich, San Carlos, all of Calif., assignors to Tribotech, Redwood City, Calif.

Filed Mar. 22, 1976, Ser. No. 669,345
Int. Cl.² F16C *23/04*
U.S. Cl. 308—72 **4 Claims**

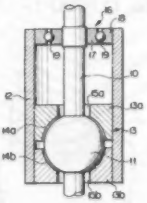


1. A self-aligning rod end bearing assembly including a bearing receiving flange extending outwardly from one face of a plate and adapted to receive and hold a bearing therein, outer portions of said plate serving to stiffen said flange, a bearing race formed in the inner surface of said flange, a bearing disposed in said race for movement therein, means for holding said bearing in said flange in cooperation with the race and a stem formed from the same plate as the bearing receiving flange for securing and self-aligning rod end bearing to an associated rod.

4,043,618
BEARING DEVICE

Tameyasu Tsukada, Tokyo; Yoshio Sumi, Yokohama; Yoshinaga Moriwaki, Yokohama; Hirosuke Oshio, Yokohama; Katsunobu Ueda, Yokohama, and Yoiti Umino, Fujisawa, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 24, 1976, Ser. No. 689,515
Claims priority, application Japan, May 26, 1975, 50-69676[U]; Mar. 25, 1976, 51-31936
Int. Cl.² F16C *19/14*
U.S. Cl. 308—174 **6 Claims**



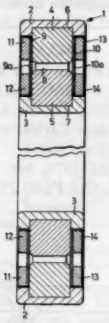
1. A bearing device comprising a rotatable shaft having a center axis, a spherical body fixed to said shaft to be rotated therewith so as to permit its center point to be brought to said center axis of said shaft, a bearing body having a concave bearing face supporting said spherical body so as to permit it to rotate about said center axis of said shaft, said bearing face having a number of supporting points situated on a spherical surface corresponding to said spherical body to support said spherical body, and a radial bearing for rotatably supporting said shaft at a position spaced apart from said spherical body.

4,043,619

SLIDING RING SEAL

Fritz Teske, Industriestr. 28, and Lothar Teske, Industriestr. 30, both of 505 Porz, Germany

Filed Aug. 16, 1974, Ser. No. 498,039
Int. Cl.[2] F16C *33/78*
U.S. Cl. 308—187.1 **15 Claims**



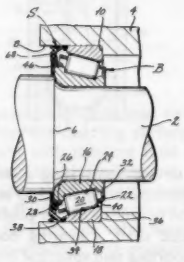
1. A sliding ring seal for bearings comprising a pair of annular members disposed in telescopic relationship with axes thereof coincident, a pair of annular rings constructed of magnetic material, a first ring being contiguous a first of said annular members and a second ring being contiguous a second of said annular members, said rings being in a generally common radial plane, a non-metallic flexible annular sealing disc bearing against said pair of rings and spanning an annular gap therebetween, a pair of annular retaining rings constructed of magnetically attractable material, a first of said retaining rings and the first of said megnetic rings having sandwiched therebetween a first peripheral portion of said sealing disc whereby the magnetic attraction between said last-mentioned two rings applies a gripping force therebetween upon said first peripheral disc portion, and a second of said retaining rings and the second of said magnetic rings having sandwiched therebetween a second peripheral portion of said sealing disc whereby the magnetic attraction between said last-mentioned two rings applies a gripping force therebetween upon said second peripheral disc portion.

4,043,620

RIB-MOUNTED BEARING SEAL

Dennis L. Otto, Malvern, Ohio, assignor to The Timken Company, Canton, Ohio

Filed May 26, 1976, Ser. No. 690,189
Int. Cl.[2] F16J *15/32*
U.S. Cl. 308—187.2 **15 Claims**



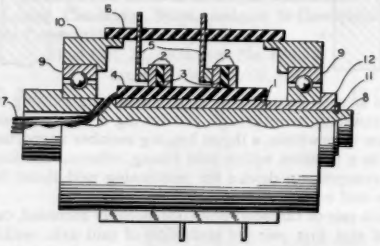
1. A seal for use on a bearing having an inner ring, an outer ring, and rolling elements between the rings, said seal comprising: a seal case formed from metal and having an axial portion and first and second radial flanges, the axial portion extending generally in the direction of the axis of rotation for the bearing and being doubled back upon itself so as to have first and second segments with one of the segments closely overlying the other segment, the first segment being sized to fit tightly in contact with one of the bearing rings, the first radial flange extending in one direction from the first segment of the axial portion such that it will be located along the ring onto which the axial portion is fitted, the second radial flange extending in the opposite direction from the second segment of the axial portion; and a flexible seal element attached to the seal case such that it will extend generally toward the other race of the bearing.

4,043,621

REPLACEABLE SLIP RING ROTOR

Richard A. Heinz, 76 Woodhaven Road, Glastonbury, Conn. 06033

Filed Apr. 2, 1975, Ser. No. 564,370
Int. Cl.[2] F16C *32/00*
U.S. Cl. 308—189 R **3 Claims**



1. A slip ring assembly for use with turbine engines and the like rotary devices, said assembly comprising a rotor assembly of metallic rings each connected to insulated leadwires and extending through said rotor assembly with said rings electrically isolated by bonding to insulating material between the axially spaced rings and between the rings and a cylindrical metallic supporting tube or sleeve which is designed to fit snugly over a metallic rotor structure but not bonded to said supporting rotor structure, said metallic rotor supporting structure provided with bearing means between said rotor assembly and a housing, housing means fully enclosing said rotor assembly and designed for assembly by inserting the said rotor assembly and supporting shaft axially into the housing with housing parts having electrically conductive brushes extending through insulated brush blocks to provide soldering terminals, said brushes positioned from diametrically opposed sides contacting alternate sets of said rings on the rotor assembly.

4,043,622

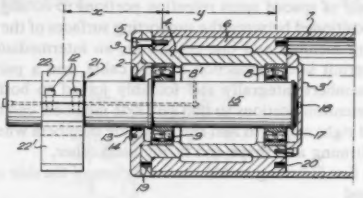
BEARING ASSEMBLY

John Devlin Hotchkiss, and William Henry Hotchkiss, both of Swanley Village, England, assignors to John D. Hotchkiss Limited, England

Filed Sept. 3, 1975, Ser. No. 609,904
Claims priority, application United Kingdom, Sept. 13, 1974, 40017/74
Int. Cl.[2] F16C *19/00*
U.S. Cl. 308—208 **11 Claims**

1. A bearing unit for a roll, said bearing unit comprising a cylindrical sleeve, a cylindrical housing received in said sleeve, a pair of spaced bearing assembles received in said housing and a stub shaft supported by said bearing assemblies; said housing and said sleeve having first and second end portions spaced by a mid-portion, the internal diameter of said first end portion of said sleeve being smaller than the internal diameter of said second end portion of said sleeve, the internal diameter of said

mid-portion of said sleeve being larger than the internal diameter of said first end portion of said sleeve, the external diameter of said first and second end portions of said housing being such as to ensure a tight fit in the respective first and second end portions of said sleeve, and the external diameter of said mid-



portion of said housing being smaller than the external diameter of said first end portion of said housing, said bearing assemblies being respectively fitted within said first and second end portions of the housing with said stub shaft extending beyond the bearing assembly in said second end portion of said housing.

4,043,623

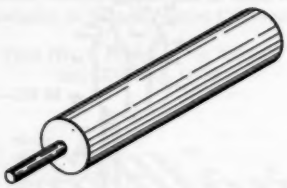
WEAR RESISTANT FILAMENT WEAR GUIDES AND METHOD OF MAKING THE SAME

John J. Rausch, Antioch, and Ray J. Van Thyne, Oak Lawn, both of Ill., assignors to Surface Technology Corporation, Oak Lawn, Ill.

Continuation-in-part of Ser. No. 388,812, Aug. 16, 1973, abandoned. This application Aug. 22, 1975, Ser. No. 606,755

Int. Cl.[2] F16C *27/00*

U.S. Cl. 308—238 **5 Claims**



1. A filament wear guide consisting essentially of:
a. a substrate member in the form of a wear guide;
b. a chromium layer on said substrate member at least in the area thereof to be contacted by a filament passing thereover, said chromium layer ranging in thickness from 5 microinches to 5 mils; and
c. a composite structure on the surface of and an integral part of said chromium layer, said composite structure being nonparticulate and continuous and being the reaction product of said chromium and a material selected from the group consisting of nitrogen and oxygen and mixtures thereof.

4,043,624

REFRIGERATION APPARATUS WALL STRUCTURE

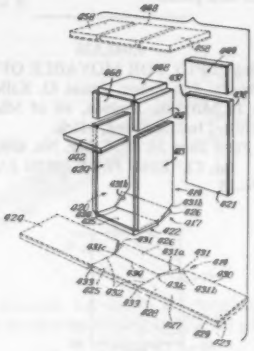
Robert E. Lindenschmidt, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Continuation-in-part of Ser. No. 433,070, Jan. 14, 1974, Pat. No. 3,916,658. This application Aug. 7, 1975, Ser. No. 602,762

Int. Cl.[2] F25D *11/00;* **A47B** *81/00*

U.S. Cl. 312—214 **16 Claims**

1. A refrigerator apparatus wall structure comprising
a generally U-shaped wall formed of a unitary laminate panel defined by an inner sheet liner and an outer insulation, said panel having a first edge, a rear edge, a mid-portion defining the bight of the U-shaped wall, end portions defining the legs of the U-shaped wall, and connecting portions at opposite sides of the mid-portion connecting said mid-portion thereto, said insulation being parted at said connecting portion, said connecting portion being turned to define continuous sheet liner corners of said



U-shaped wall, said panel further having notches in said rear edge at opposite sides of said mid-portion, said insulation being further parted along a line between the forward ends of said notches and said liner being turned along said liner to define an inclined rear portion of said bight extending substantially between said legs.

4,043,625

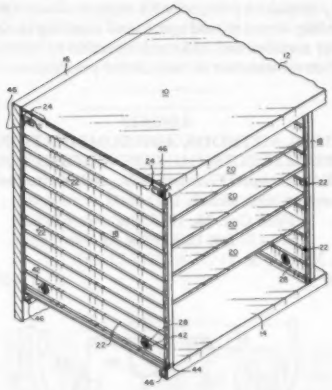
CAM SECURED SUPPORT PANEL

Raymond A. Bleeker, Grand Rapids, Mich., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 26, 1976, Ser. No. 661,459

Int. Cl.[2] A47B *88/00;* **F16M** *11/26*

U.S. Cl. 312—351 **4 Claims**



1. A support panel for supporting a plurality of shelves, trays or the like within a larger storage cavity, said support panel comprising:
a planar panel member having a length substantially equivalent to the depth of said cavity and a height approximately the height of said cavity, said panel including a plurality of horizontal slots in at least one side thereof adapted to receive said plurality of shelves, trays or the like;
means adjacent the top edge of said panel for supporting said panel within said cavity; and

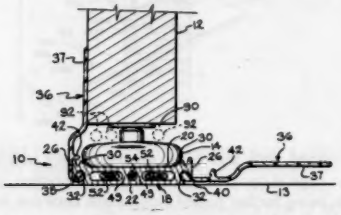
adjusting means associated with the bottom edge of said panel, said adjusting means including a pair of cam discs having a series of flat surfaces of progressively greater radial dimension from the center of said cam disc, journaled within said panel and extending through an opening in the bottom edge thereof, said cam discs adapted for rotation within said panel to thereby change the effective height of said panel.

4,043,626

POWER SUPPLY FOR MOVABLE OFFICE UNIT

Robert L. Propst, Ann Arbor; James O. Kelley, Spring Lake, and Terry L. Mitchell, Jenison, all of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed June 24, 1976, Ser. No. 699,253
Int. Cl.[2] E04F *19/04*; H02G *3/28*
U.S. Cl. 339—23 **5 Claims**



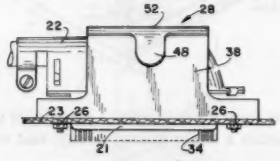
1. Electrical energy distributing apparatus comprising a longitudinally extending track having top and bottom surfaces and adapted for positioning on a supporting surface, a wall member having a lower end and depending leg members connected to and supporting said wall member on said track in a position in which said wall lower end is spaced above said track top surface to form a space, a cover member extending longitudinally of said track for covering said space between said wall lower end and said track top surface, means mounting said cover member on said track for movement between an upright closed position blocking access to said space and an angularly displaced position with respect to said upright position enabling access to said space, and coacting latch means on said cover member and said track operable to releasably maintain said cover member in said closed position.

4,043,627

DEVICES, METHODS, AND COMBINATIONS FOR SECURING ELECTRICAL CONNECTORS TOGETHER

George Edward Ayer, Endicott, N.Y., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Oct. 28, 1975, Ser. No. 626,023
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—75 R **35 Claims**



1. A device for releasably securing a pair of mating electrical connectors together and for retention by one of the connectors when said one connector is retained by a pair of spaced apart supporting surfaces of a supporting member, the one connector including spaced apart co-planar supporting surfaces for alignment with the supporting surfaces of said supporting member and an intermediate portion with contact terminal members arranged for electrical connection to a multiconductor cable, the other connector including a housing member with outer surfaces spaced apart from said one connector, said device comprising

a. a one piece flexible and sturdy planar member having a pair of spaced apart retention portions to co-align and be positioned between the supporting surfaces of the supporting member and one connector, an intermediate slot to permit said connection to said cable, and a pair of side members integrally and foldably joined to both of said retention portions so that said side members can be folded at right angles to said slot, said side members when folded forming a U shape and facing each other,

b. a first fastening means carried by one of the side members, and

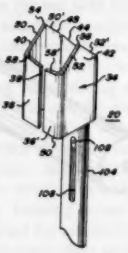
c. a second fastening means carried by the other of the side members, the first and second fastening means being arranged for cooperation with the housing surfaces of the other connector and with each other to retain the connectors together.

4,043,628

ELECTRICAL CONTACT

Ronald S. Narozny, Panorama City, Calif., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed June 18, 1976, Ser. No. 697,625
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—99 R **16 Claims**



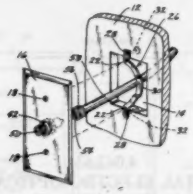
1. An electrical contact comprising: a head portion having a generally rectangular configuration in transverse section and having an upper end and a lower end; and a tail portion integral with and extending from said lower end of said head portion; said head portion being defined by a front wall, a rear wall, and a pair of spaced, opposing sidewalls, there being an elongate first slot extending along the length of and separating said front wall into two front wall portions, there being an elongate second slot extending a given distance along the length of said rear wall from said head portion upper end towards said head portion lower end, said front wall portions, said rear wall, and said sidewalls each terminating at a respective cutting edge adjacent said upper end of said head portion for piercing the insulation about an insulated conductor, the sides of said first and said second slots comprising additional cutting edges, at least one of said additional cutting edges being arranged to sever the insulation about an insulated conductor and engage such conductor, said rear wall having spaced side edges, each of said front wall portions and a respective sidewall connected thereto being hingedly joined to a respective side edge of said rear wall for cantilevered outward deflection of said sidewalls about a respective rear wall side edge upon the receipt of a conductor within said first slot.

4,043,629

RADIO-ANTENNA WALL PLATE ASSEMBLY

H. David Brannen, Carroll, Iowa, assignor to DB Electronics, Inc., Carroll, Iowa

Filed Oct. 29, 1976, Ser. No. 736,696
Int. Cl.[2] H01R 17/18; H02B 1/02
U.S. Cl. 339—126 J 8 Claims



1. A radio-antenna wall plate assembly for coaxial cable comprising,

a cover wall plate for the room side of a wall opening,

a wall bracket for connecting the wall plate to a room wall, and

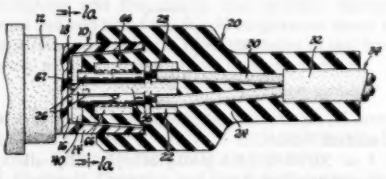
a coupling member integrally connected to said wall plate and having opposite ends on opposite sides of said plate for interconnecting radio and antenna cables.

4,043,630

MOLDED ELECTRICAL CONNECTOR

Lyle B. Suverison, Fowler, and William R. Beck, Warren, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 8, 1976, Ser. No. 730,932
Int. Cl.[2] H01R 13/58
U.S. Cl. 339—218 M 6 Claims



1. A preformed insert of insulating material for a molded electrical connector comprising:

a front plate having a plurality of spaced apertures extending therethrough,

an elongated turret attached to a rearward face of the front plate and disposed normal thereto,

said elongated turret having a plurality of spaced channels, each aligned with a respective aperture,

each of said channels having a lateral opening at the periphery of the turret which extends the length of the channel for laterally receiving an electrical terminal attached to the bared conductor of an insulated electrical lead,

each of said channels having a transverse yoke wall spaced from said front plate to define a terminal receiving portion in said channel, and

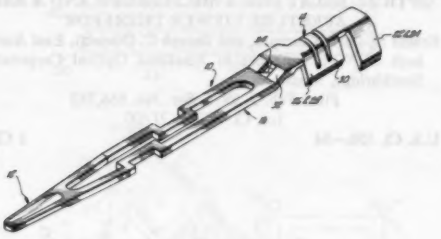
each of said terminal receiving portions of said channels being defined in part by a resiliently deflectable wall of the turret having a retention lip at a free end thereof for laterally retaining an electrical terminal snapped therepast into the terminal receiving portion of the channel.

4,043,631

ELECTRICAL TERMINAL STRUCTURE FOR CONNECTOR

Rubin Lapes, Los Angeles, Calif., assignor to Hollingsead-Pryor Enterprises, Los Angeles, Calif.

Filed Apr. 26, 1976, Ser. No. 679,986
Int. Cl.[2] H01R 13/06
U.S. Cl. 339—252 R 6 Claims



1. A contact element, for use in an electrical connector having a support member providing an internal passage, comprising:

an elongated, generally flat, resilient, unitary metal body, the first end of which is adapted to be in electrical contact with a wire and the second end of which is adapted to contact another contact element,

the second end of said body being brought into electrical contact by movement in a direction not in the plane of the body and having sufficient resilience to deflect away from said plane when in contact,

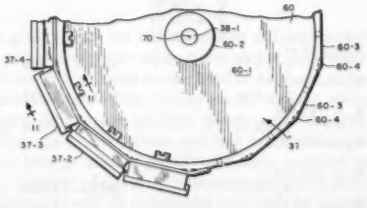
the intermediate portion of the body having two longitudinally extending side branches separated by a space therebetween and each having an externally facing indentation adapted to engage complementary projections provided in the passage in the support member, each indentation having a pair of oppositely facing shoulders, the indentations of the two branches being longitudinally spaced from one another, each of said side branches having sufficient resilience to deflect in the plane of the body toward the other wall to permit its longitudinal motion into the passage until its indentation coincides with the complementary projection, whereupon its resilience automatically causes its indentation to interlock with the projection.

4,043,632

SCANNING POLYGON WITH ADJUSTABLE MIRRORS

Edwin A. Jeffery, Natick, and Sigmund Hinlein, Sudbury, both of Mass., assignors to Data General Corporation, Southboro, Mass.

Filed May 27, 1975, Ser. No. 581,273
Int. Cl.[2] G02B 27/17
U.S. Cl. 350—7 4 Claims



1. A rotatable polygon comprising a hub, said hub having a plurality of flat faces positioned about the circumference thereof, said faces intersecting each other at corners and each of said corners having a plurality of locating slots, a plurality of O rings of elastomeric material, each O ring positioned in a

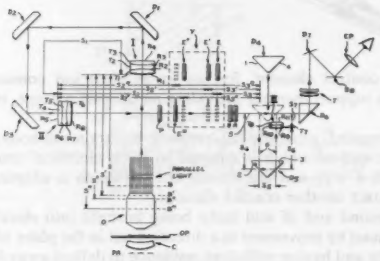
different locating slot of each of said corners, and lying over said faces, a plurality of supports each having a mirror coupled thereto, and adjustable means supported by said hub and coupled to said supports for urging said supports against said O rings, adjustment of said adjustable means orienting said mirrors with respect to the axis of rotation of said polygon.

4,043,633

OPTICAL RELAY FOR A MICROSCOPE AND A BACK APERTURE VIEWER THEREFOR

Ernest D. Park, Clarence, and Joseph C. Dianetti, East Aurora, both of N.Y., assignors to American Optical Corporation, Southbridge, Mass.

Filed Feb. 9, 1976, Ser. No. 656,763
Int. Cl.[2] G02B *21/00*
U.S. Cl. 350—54 **1 Claim**



1. In a microscope having an observation system including in optical alignment along an axis, an objective, a telescope lens and an eyepiece, said objective having a back focal plane and said eyepiece having an image plane, a relay lens system to relay said back focal plane to an optically equivalent location in a station positioned between said objective and said telescope lens and an optical element at said station selectively positionable in said location for rendering said optical element operable in a manner equivalent to being positioned in said back focal plane, the improvement comprising, said relay lens system having first and second identical positive components, said components having parameters of lens radii (R_1 - R_8), wherein a minus sign (—) indicates a center of curvature on the objective side of the lens, lens thicknesses (T_1 - T_6), axial spaces among lens elements and back focal plane (S - S_2), refractive indices (ND_1 - ND_6) and Abbe numbers (ν_1 - ν_6), are determined by the following relationship, all radii, thicknesses, and spaces being in millimeters

Lens	Radius	Thickness	Spacing	Index of Refraction	Abbe Number
			S = 149.09		
			S' = 156.50		
			S'' = 158.52		
			S''' = 166.42		
	R_1 = 128.461				
		T_1 = 5.22		ND_1 = 1.54739	ν_1 = 53.63
	R_2 = — 59.123				
I		T_2 = 4.00		ND_2 = 1.65332	ν_2 = 39.71
	R_3 = 83.524				
		T_3 = 4.30		ND_3 = 1.65844	ν_3 = 50.88
	R_4 = — 175.509				
			S_1 = 327.11		
	R_5 = 175.509				
		T_4 = 4.30		ND_4 = 1.65884	ν_4 = 50.88
	R_6 = — 83.524				
II		T_5 = 4.00		ND_5 = 1.65332	ν_5 = 39.71
	R_7 = 59.123				
		T_6 = 5.22		ND_6 = 1.5739	ν_6 = 53.63
	R_8 = — 128.461				
			S_2 = 177.85		
			S_2' = 170.60		
			S_2'' = 168.44		
			S_2''' = 161.22		

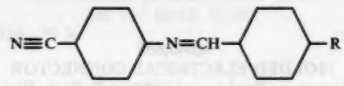
4,043,634

LIQUID CRYSTAL ELECTRO OPTICAL ELEMENT

Kenji Nakamura; Toshio Jinnai; Kazuo Totani, all of Kanagawa, and Shigetaro Furuta, Fujisawa, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

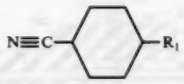
Filed Dec. 13, 1974, Ser. No. 532,602
Claims priority, application Japan, July 25, 1974, 49-84568; July 25, 1974, 49-84569; Aug. 31, 1974, 49-100137; Sept. 5, 1974, 49-101348; Sept. 5, 1974, 49-101349; Sept. 5, 1974, 49-101350
Int. Cl.[2] C09K *3/34*; G02F *1/13*
U.S. Cl. 350—160 LC **6 Claims**

1. A liquid crystal electro-optical display element which comprises a nematic liquid crystal composition having positive dielectric anisotropy which consists essentially of a p-n-alkylbenzylidene-p'-cyanoaniline having the formula



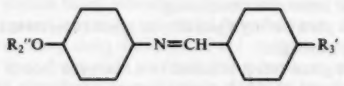
wherein R represents n-propyl or n-hexyl; or a mixture thereof; and an improver selected from the group consisting of:

1. 3 to 10 wt.% of a p-n-alkylcyanobenzene having the formula



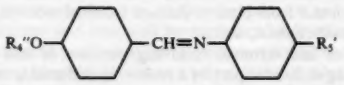
wherein R_1 represents n-propyl, n-butyl, n-pentyl or n-hexyl; or a mixture thereof;

2. 5 to 50 wt.% of a p-alkylbenzylidene-p'-alkoxyaniline having the formula



wherein R_2'' and R_3' are respectively methyl, ethyl, n-propyl, n-butyl, n-pentyl, n-hexyl, n-heptyl or n-octyl; or a mixture thereof; and

3. 5 to 50 wt.% of a p-alkoxybenzylidene-p'-n-alkylaniline having the formula



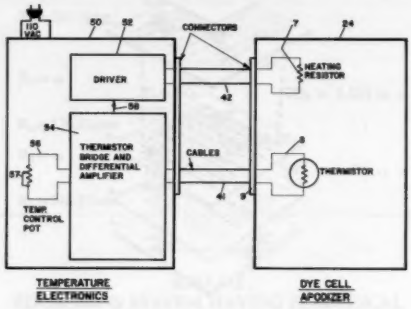
wherein R_4'' represents methyl or ethyl and R_5' represents n-butyl or n-heptyl; or a mixture thereof.

4,043,635

TEMPERATURE CONTROL FOR APODIZERS

Larry D. Siebert, Ann Arbor, Mich., assignor to KMS Fusion, Inc., Ann Arbor, Mich.

Filed Nov. 21, 1974, Ser. No. 525,829
Int. Cl.[2] G02F 1/32
U.S. Cl. 350—160 R 6 Claims



1. An apparatus for dye cell refractive index matching which comprises:

a. first means forming an optical aperture and a support therefor, each being formed of material having relatively high thermal conductivity,

b. optically transparent means supported in said aperture in thermal conductive relationship with and forming an annular cavity adjacent the inner periphery of said first means,

c. a liquid within said cavity in thermal conductive relationship with said first means and said transparent means having a characteristic of changing its refractive index with a change of liquid temperature and having a refractive index closely matched to that of said transparent means at a temperature above room temperature, and

d. heating means associated with said support for maintaining the temperature of said apparatus substantially uniform throughout said first means, said optically transparent means and said liquid and at said temperature above room temperature such that the refractive index of said liquid is closely matched to that of said transparent means.

4,043,636

ILLUMINATION-PANEL FOR LIQUID CRYSTAL DISPLAY OF SIMILAR DEVICE

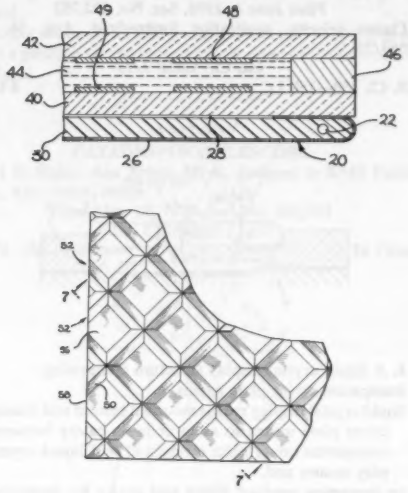
Noel H. Eberhardt, Cupertino, and Ron F. Keller, Aptos, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 535,188, Dec. 23, 1974, abandoned. This application Aug. 1, 1975, Ser. No. 600,979
Int. Cl.[2] G02F 1/13
U.S. Cl. 350—160 LC 5 Claims

1. In a passive electro-optical display having a pair of substrates defining a volume, a liquid crystalline substance disposed in said volume, at least one of said substrates having electrodes disposed thereon to permit excitation of said liquid crystalline substance, the improvement comprising:

an edge lit light conductive body abutting one of said substrates to provide light conduction for illuminating said liquid crystalline substance, said light conductive body having a window with a surface formed into a plurality of subsurfaces, said plurality of subsurfaces forming a repetitive pattern of planar subsurfaces, and each subsurface being inclined with respect to at least one other subsurface of said plurality of subsurfaces;

a light source disposed adjacent to said light conductive body along an edge to provide illumination through said light conductive body generally parallel to said window and through said substrate to said liquid crystalline substance; and



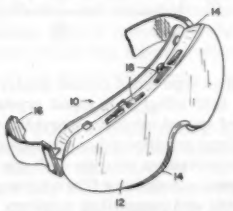
a specular layer disposed on said light conductive body, to reflect light from said light source incident upon said light conductive body through said window.

4,043,637

PHOTOCHROMIC LIGHT VALVE

Richard J. Hovey, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Continuation-in-part of Ser. No. 370,247, June 15, 1973, abandoned, which is a continuation-in-part of Ser. No. 268,317, July 3, 1972, abandoned. This application Oct. 6, 1975, Ser. No. 619,749
Int. Cl.[2] G02F 1/17
U.S. Cl. 350—160 P 19 Claims



1. Ski goggles and the like comprised of frame means defining apertures arranged to support lens means, said frame means arranged to be positioned on the head of a wearer to hold said lens means in front of the eyes of such a wearer, there being lens means filling said aperture means and arranged to be looked through by the wearer, said lens means comprised of at least one lens of allyl diglycol carbonate imbibed with an effective quantity of a metal dithizonate; the metal dithizonate being imbibed in said allyl diglyciol carbonate by immersing in the form of a lens in a heated, saturated solution of the metal dithizonate in toluene for an extended period of time sufficient to substantially uniformly disperse the dye throughout the lens, the dyed lens so produced being resistant to dye removal in heated aqueous media.

4,043,638

LIQUID CRYSTAL DISPLAY MOUNTED BEHIND A FRONT GLASS

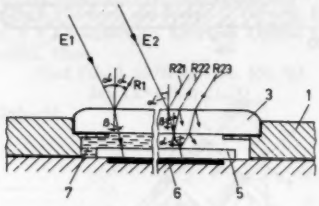
Meinolph Kaufmann, Fislisbach, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed June 4, 1976, Ser. No. 692,752

Claims priority, application Switzerland, Aug. 14, 1975, 10569/75

Int. Cl.² G02F 1/13

U.S. Cl. 350—160 LC **6 Claims**



1. A liquid crystal display structure comprising:

transparent cover plate means,

liquid crystal display means mounted behind said transparent cover plate means so as to define a cavity between said transparent cover plate means and said liquid crystal display means; and,

an immersion medium filling said cavity for improving the legibility of said liquid crystal display means.

4,043,639

FIELD EFFECT TYPE LIQUID CRYSTAL DISPLAY ELEMENTS PROVIDED WITH POLARIZING PLATES

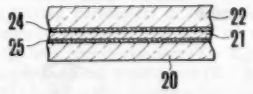
Sigeru Matsuyama; Hironari Tanaka; Masaharu Koyama, and Tadashi Ishibashi, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed June 25, 1976, Ser. No. 699,867

Claims priority, application Japan, July 7, 1975, 50-82739

Int. Cl.² G02F 1/13

U.S. Cl. 350—160 LC **4 Claims**



1. In a field effect type liquid crystal display element of the type wherein a field effect type liquid crystal is interposed between a pair of spaced substrates provided with electrodes and polarizing plates are disposed on the outside of respective substrates, the improvement wherein each one of said polarizing plates comprises a polarizing film consisting essentially of polyvinyl chloride and supporting members bonded to the opposite sides of said polarizing film by a bonding agent, said polarizing plates containing an ultraviolet ray absorbing agent.

4,043,640

LIQUID CRYSTAL TWIST CELL WITH GREY SCALE CAPABILITIES

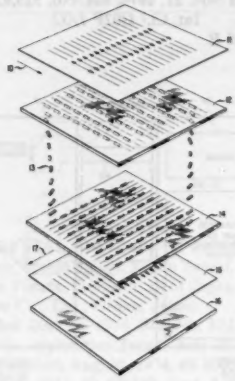
Dwight Winton Berreman, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 26, 1975, Ser. No. 617,074

Int. Cl.² G02F 1/13

U.S. Cl. 350—160 LC **4 Claims**

1. A liquid crystal twist cell device with improved grey scale capabilities, said device containing a liquid crystal material of positive dielectric anisotropy characterized in that the relationship between the elastic constants of the liquid crystal is given by



$$0.01 \leqq \frac{k_{11}}{k_{33}} \leqq 0.3 .$$

4,043,641

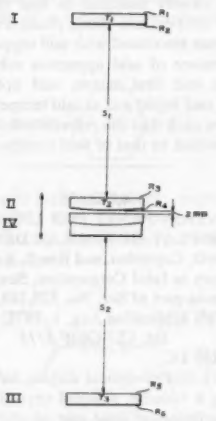
THREE-LENS SYSTEM PROVIDING A VARIABLE FOCAL POWER ALONG ONE PRINCIPAL MERIDIAN

Nathan Gottlieb, Kenmore, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed July 16, 1976, Ser. No. 705,852

Int. Cl.² G02B 13/08

U.S. Cl. 350—181 **2 Claims**



1. An optical system for varying focal power along one principal meridian comprising, in alignment along an optical axis, two-spaced cylinder lenses I and II having their axis of cylinder in a plane passing through the optical axis and an axially-slidable cylindrical lens III having an axis of cylinder perpendicular to said plane, said lenses having values set forth in the following table wherein axial thicknesses of successive lenses are designated T_1 to T_3, successive axial spaces are designated S_1 to S_2, successive lens radii are designated R_1 to R_6 wherein the radius denotes cylinder curvature about a line lying on the side opposite the focal-plane side of the lenses, refractive indices and Abbe numbers of the glasses in the suc-

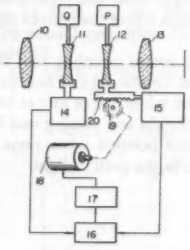
cessive lenses are absolute values designated ND_1 to ND_3 and ν_1 to ν_3,

Lens	Cyl. Radius	Thickness(T)	Spacing(S)	Index of Refraction(ND)	Abbe No. (ν)
	$R_1 = \infty$				
I		T_1=5.0-mm		$ND_1 = 1.523$	$\nu_1 = 58$
	R_2=261.5mm				
			S_1= 28.3 to 139.4mm		
	$R_3 = \infty$				
II		T_2=5.0-mm		$ND_2 = 1.523$	$\nu_2 = 58$
	R_4=174.33mm				
			S_2=160.4S_1		
	$R_5 = \infty$				
III		T_3=5.0-mm		$ND_3 = 1.523$	$\nu_3 = 58$
	R_6=348.67mm				

4,043,642
ZOOM LENS SYSTEM HAVING ELECTRICAL CONTROL OF MOVING ELEMENTS

Ryusho Hirose, Machida, and Takao Tsuji, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 446,760, Feb. 28, 1974, abandoned.
This application Oct. 31, 1975, Ser. No. 627,867
Claims priority, application Japan, Mar. 6, 1973, 48-26343; Aug. 2, 1973, 48-87041; Aug. 6, 1973, 48-88149
Int. Cl.[2] G02B *15/18*
U.S. Cl. 350—184 9 Claims



1. A zoom lens system without a single focusing lens at the front part of the lens system comprising:

a variation movable lens group relating to the focal length of the whole optical system and being capable of moving along the optical axis;

a compensation movable lens relating to focusing and being capable of moving along the optical axis;

a fixed lens group in front of the movable lens groups;

a diaphragm;

a fixed lens group in front of a photosensitive material plane;

a first detecting means for detecting the distance, *c*, between the actual position of said variation movable lens group and the basic position of magnification variation in order to supply a magnification variation signal;

a second detecting means to detect the distance, *a*, between the actual position of said compensation movable lens group and the basic position of compensation in order to provide a compensation signal, wherein the basic position of compensation is determined as a position in which focus is on an object at an infinite position when said compensation movable lens group is at said basic position and variation movable lens group is fixed at said basic position of magnification variation;

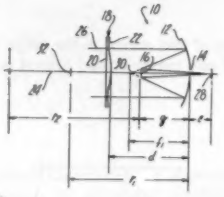
an operation means responsive to said compensation signal and said magnification signal for providing a control signal corresponding to the desired distance, *b*, between the position of said compensation lens group and said basic position of compensation, said operation means providing said signal in accordance with a predetermined functional relationship of distances c and a of the variation movable lens group and said compensation movable lens group; and

a setting means to set said compensation movable lens group at a position on the optical axis in response to said control signal.

4,043,643
CATADIOPTIC TELESCOPE

Robert D. Sigler, Ann Arbor, Mich., assignor to KMS Fusion, Inc., Ann Arbor, Mich.

Filed May 14, 1976, Ser. No. 686,363
Int. Cl.[2] G02B *17/08*
U.S. Cl. 350—200 16 Claims



1. A telescopic objective comprising; in combination; a corrector plate, a first spherical mirror having a central hole therein, and a second spherical mirror all of which are constructed and arranged on a common geometric axis, the geometric centers of the radii of curvature of said first and second spherical mirrors are not coincident, the radius of curvature of said second spherical mirror is less than the radius of curvature of said first spherical mirror, the vertex of said corrector plate is positioned on the common geometric axis between and spaced from both the geometric center of the radius of curvature of said first spherical mirror and the focal point of said first spherical mirror, and the vertex of said second spherical mirror is positioned on the common geometric axis between and spaced from both the vertex of said first spherical mirror and the focal point of said first spherical mirror such that light passing through the corrector plate and collected by said first spherical mirror is reflected by said second spherical mirror to pass through said hole in said first spherical mirror and form an image on an image surface intersecting the geometric axis beyond the vertex of said first spherical mirror.

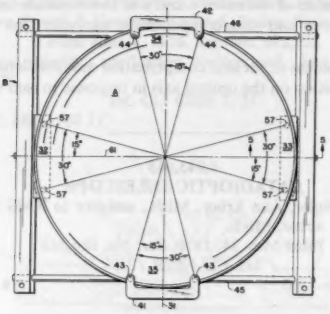
4,043,644
ELASTICALLY COMPENSATED OFF-AXIS MIRROR

William E. Humphrey, Orinda, Calif., assignor to Humphrey Instruments, Inc., San Leandro, Calif.

Filed July 15, 1976, Ser. No. 705,655
Int. Cl.[2] G02B *5/10*
U.S. Cl. 350—295 13 Claims

8. In the combination of a mirror and an elastic warping harness mounted to said mirror for warping said mirror for off-axis use, the improvement in said mirror comprising: a disk of elastically deformable glass with an active optical front surface on a side approximating a sphere; said sphere of said optical surface having a first and relatively large radius of curvature at least equal to or exceeding two and a half times the diameter of said mirror; said disk of glass having on the opposite and rear side thereof from said active optical surface a rough ground surface having a radius of curvature different than the radius of curvature of said active optical surface, said mirror having a thickness at a central point in the range of one fifth of one fifteenth of its diameter; and, the radius of curva-

ture of said opposite and rear side with respect to said front surface being selected to produce a decrease in mirror thick-



ness at the edges of said mirror in the range of 0.21 to 0.42 of the thickness of said mirror at said central point.

4,043,645

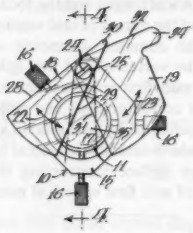
FILTER DEVICE WITH ADJUSTABLE SUPERIMPOSED FILTERS

Louis A. Fazzari, 6425 Durand Ave., Racine, Wis. 53406

Filed Aug. 8, 1975, Ser. No. 603,105

Int. Cl.[2] G02B *5/22*

U.S. Cl. 350—315 **1 Claim**



1. A filter device for correcting color deficiencies in a light beam projected from a color picture projector lens in which the light beam is noticeably dominant in a color, comprising: a pair of light transparent color filters, each of the color complementary to said dominant color; means for mounting said filters in superimposed relationship for arcuate movement about a pivot axis individually relative to each other and to said projector lens; means for moving each of said filters through intermediate positions between fully open light beam non-intercepting position and maximum closed light beam intercepting position thereby varying both the amount of overlap and thus the degree of filtering and the area of light beam intercept; and a spring member frictionally engaging said pair of filters selectively retaining each said filter in any said intermediate position as well as said fully open and said fully closed positions, each said filter having opposed straight edges on one side of the center of said light beam in fully open position and on opposite sides of the center of said light beam in maximum closed position.

4,043,646

FILTER MECHANISM WITH INTERCONNECTED HEAT AND COLOR FILTERS FOR OPTICAL EXAMINATION DEVICES

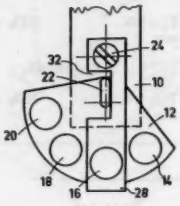
Helmut A. Heine; Otto H. Schmidt, and Hans J. Spitschan, all of Herrsching, Germany, assignors to Propper Manufacturing Co., Inc., Long Island City, N.Y.

Filed May 27, 1976, Ser. No. 690,423

Claims priority, application Germany, Sept. 17, 1975, 2541503

Int. Cl.[2] G02B *5/22, 7/00;* A61B *3/10, 3/07*

U.S. Cl. 350—315 **5 Claims**



1. A filter mechanism for use with a source of light, comprising:

at least one color filter;

first supporting means mounting said at least one color filter for movement in and out of the path of light emanating from said light source;

a heat protection filter;

second supporting means mounting said heat protection filter for movement between at least one active position in the path of light from said light source and at least one inactive position out of the path of light from said source; and

interconnecting means coupling said first and second supporting means for placing said heat protection filter in said active position when one of said at least one color filter is in the path of light and placing said heat protection filter in said inactive position when none of said at least one color filter is in the path of light.

4,043,647

METHOD OF FORMING ALIGNMENT FILM FOR LIQUID CRYSTAL DISPLAY CELL

Michio Oue; Osamu Asai, both of Hitachi; Kishiro Iwasaki, Hitachiota, and Hideaki Kawakami, Mito, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 11, 1976, Ser. No. 713,581

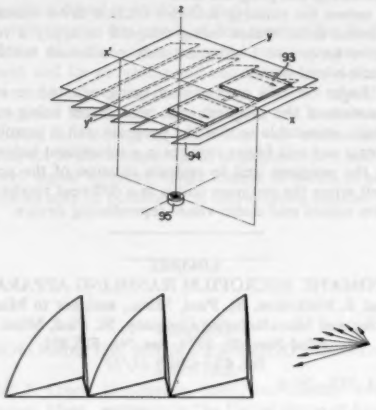
Claims priority, application Japan, Aug. 15, 1975, 50-98620

Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—320 **14 Claims**

1. A method of forming an alignment film of biaxial anisotropy which comes into contact with liquid crystal molecules to orient the liquid crystal molecules, comprising the steps of disposing a louver consisting of a plurality of leaves between the surface of a substrate on which the alignment film is to be formed and an evaporation source serving as a material for the alignment film, said leaves being arranged in parallel with one another and spaced from the surface of the substrate at an angle

with respect thereto, and depositing particles evaporated from the evaporation source at reduced pressures on the surface of



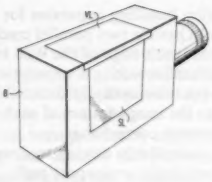
the substrate at angles of incidence of 45° to 75° through said louver.

4,043,648

FILM COUNTER FOR USE WITH A PORTABLE CINE-CAMERA

Katsuhide Takagi, Okaya, Japan, assignor to Sankyo Kogaku Kogyo Kabushiki Kaisha, Suwa, Japan

Filed Mar. 24, 1975, Ser. No. 561,503
Claims priority, application Japan, Mar. 23, 1974, 49-32260; Mar. 23, 1974, 49-32629[U]
Int. Cl.² G03B *23/02, 1.60*
U.S. Cl. 352—72 **14 Claims**



1. A film counter for use with a cine-camera capable of selectively using first and second cartridges respectively containing photographic films of first and second lengths, said film counter comprising:

a. counter indicator means;

b. gear train means for moving said counter indicator means at first and second speed ratios, corresponding to said first and second film lengths, coincidently with the movement to said film during photography, when said gear train means is in a first and second state, respectively;

c. figure indicator means having a first and second set of numbers thereon, said figure indicator means being positioned to display only one of said first and second sets of numbers, adjacent said counter indicator means, when said figure indicator means is in first and second positions, respectively; and

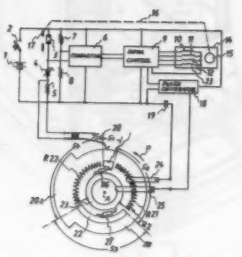
d. cartridge detecting means responsive to the loading of said first and second type cartridges for causing said gear train means to be in said first and second states, respectively, and for causing said figure indicator to be in said first and second positions, respectively, said cartridge detecting means comprising a detection lever having a detecting portion, actuated with a flat wall of a film cartridge of said second type and positioned to be moved from a normal position to second position.

4,043,649

FADE CONTROL FOR MOTION-PICTURE CAMERA

Helmut Mayr, Taufkirchen, Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Mar. 8, 1976, Ser. No. 664,807
Claims priority, application Germany, Mar. 26, 1975, 2513374
Int. Cl.² G03B *21/36*
U.S. Cl. 352—91 C **18 Claims**



1. In a motion-picture camera capable of producing fadeover effects, in combination, an adjustable diaphragm; a stepper motor coupled to the diaphragm; a train or motor input pulses having a pulse-repetition frequency; a stepper motor control circuit connected to the pulse-generating means and the stepper motor and operative for causing the stepper motor to perform a step-by-step change of the diaphragm aperture size, one step per motor input pulse; fadeover means connected to the stepper motor control circuit and effecting a fade-out operation by causing the stepper motor to perform a step-by-step decrease of the diaphragm aperture size at a rate corresponding to said frequency, a film rewind operation, and a fade-in operation by causing the stepper motor to perform a step-by-step increase of the diaphragm aperture size at a rate corresponding to said frequency; and frequency-control means operative during the performance of the fade-out operation for progressively increasing said frequency and operative during the performance of the fade-in operation for progressively decreasing said frequency.

4,043,650

FILM HANDLING DEVICE

Kenyon A. Hapke, Libertyville, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 9, 1976, Ser. No. 647,803
Int. Cl.² G03B *31/00, 1/48, 23/02;* G11B *31/00*
U.S. Cl. 353—15 **9 Claims**

1. An improved film handling device for use with a projector having a film drive means, a projector gate, and including a tape cassette player for reproducing audible messages associated with the film frame image, the improvement comprising:

means for slidably mounting said tape cassette player for manual movement between a first loading position and a second playing position;

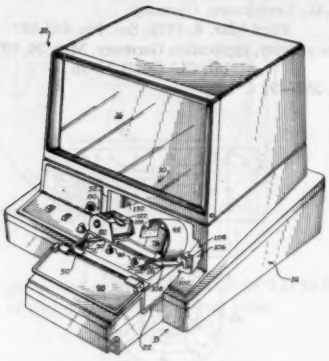
a support frame pivotally mounted to said tape cassette player, said support frame being adapted to removably mount a film strip and an audio tape cassette;

cam means on the projector for automatically moving said support frame relative to said tape cassette player from a first loading position, providing access to mount said audio cassette and said film strip thereon, to a second playing position generally within the projector, in conjunction with movement of said tape cassette player between its respective positions;

biasing means on the projector for automatically moving said support frame relative to the tape cassette player from

said second playing position to said first loading position in conjunction with movement of said tape cassette player between its respective positions;

means defining a film storage cavity on said support frame for receiving and storing a predetermined length of coiled film for movement of the stored film into a position in



alignment with the projector gate upon movement of the tape player to its playing position; and

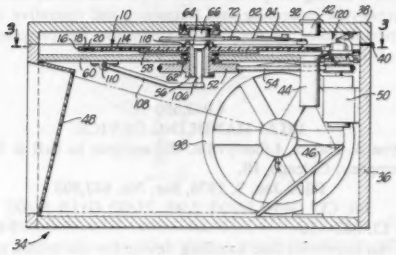
a film drive spool on the support frame associated with the film drive means for driving film from said storage cavity past the projector gate, said drive spool drivingly engaging said drive means when the tape player is moved to its playing position.

4,043,651

AUDIO-VISUAL DEVICE

Robert J. Livingston, 13075 Blairwood Drive, North Hollywood, Calif. 91604

Filed Apr. 8, 1966, Ser. No. 541,179
Int. Cl.[2] G03B *31/06*
U.S. Cl. 353—19 **16 Claims**



1. An audio-visual device which comprises:

means for holding a program unit stationary, said stationary program unit including means representing an audio signal and a plurality of visual representations,

optical system means for projecting a single one of said visual representations at a time,

rotatable audio reproduction pickup means for obtaining an audio signal from said means representing an audio signal,

means for rotating said pickup means with respect to said program unit when said stationary program unit is held by said means for holding so that said pickup means is capable of obtaining all of said audio signal during the use of said audio-visual reproducing device,

a control unit, said control unit being adapted to engage with a program unit within said audio-visual device so as to control the program unit so that the program unit incrementally advances within said audio-visual device so as to sequentially present successive visual indications to said optical system,

said control unit includes a finger adapted to engage in index notches in the program unit,

said means for rotating includes friction drive means, said friction drive means being adapted to apply a rotative drive torque to a program unit positioned within said audio-visual device,

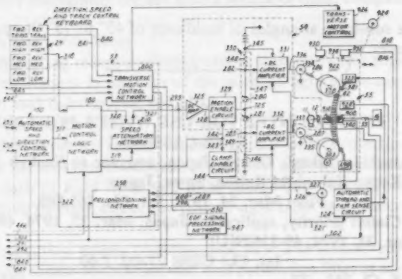
said finger on said control unit being adapted to restrain rotation of the program unit, said finger being momentarily retractable so that the program unit is permitted to rotate and said finger engages in a subsequent index notch in the program unit to restrain rotation of the program unit when the program unit is in a different rotative position within said audio-visual reproducing device.

4,043,652

AUTOMATIC MICROFILM HANDLING APPARATUS

Micheal J. Mickelson, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 20, 1974, Ser. No. 525,402
Int. Cl.[2] G03B *23/12*
U.S. Cl. 353—26 A **8 Claims**



1. In a microfilm handling apparatus for controlling motion of microfilm webs having two parallel tracks of image frames, one track adjacent each edge of the web to position an image frame of said microfilm web in a viewing station, wherein said microfilm web contains optically detectable position markers corresponding to the image frames of each of said two parallel tracks, said apparatus comprising:

a. means for controllably driving said web in a given direction of travel along a transport path:

b. light detection means for optically detecting said position markers, such that a position signal is produced when a position marker is adjacent said light detection means; and

c. web position regulation means controlled by said position signal for stopping the driving means when a said position marker is positioned adjacent said light detection means,

the improvement wherein said light detection means comprises two sets of light detectors, a first set for optically detecting position markers corresponding to image frames of a track adjacent one edge of the web and the other set for optically detecting position markers corresponding to image frames of the other track adjacent the opposite edge of the web, each of said sets of light detectors comprising at least three light detectors, two of which are abutting each other and have an effecting sensing diameter at said focal plane which is not greater than one-half the dimension of a position marker parallel to the direction of motion of the web such that two separate detected signals are produced when a position marker is detected, and a third detector for producing a light level reference signal, wherein

said web position regulation means further comprises a position signal conditioning network means coupled to the outputs of said detectors of each set detectors for comparing a said light level reference signal and a said detected

signal and for producing a position signal only when the difference between said reference signal and said detected signal exceeds a predetermined value to thereby automatically adjust the threshold sensitivity level at which a position signal is produced, and

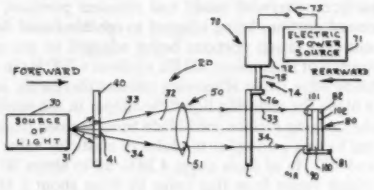
wherein means are provided for sensing the final image frame of one of said two parellel tracks at one end of the web and for providing and end-of-web signal thereupon, means for reversing the direction of travel of said web in response to said end-of-web signal and transverse drive means for shifting the microfilm web transversely with respect to the transport path in response to a said end-of-web signal whereby image frames of either of said two tracks may be positioned in said viewing station.

4,043,653

HOLOGRAPHIC HIGH RESOLUTION CONTACT PRINTER

Richard F. Croce, El Granada, Calif., and Gardner T. Burton, Danvers, Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 8, 1976, Ser. No. 647,528
Int. Cl.[2] G03B *27/02, 27/32*
U.S. Cl. 355—2 **6 Claims**



1. A holographic high resolution contact printer for use with a transparency having a pattern thereon, and with a light-sensitive recording medium of the photoresist type having a light-sensitive front surface and a substrate rear surface, wherein said front surface has been previously exposed to a preselected diffraction grating, and wherein said photoresist has not been developed, and also wherein said transparency and said light-sensitive front surface of said recording medium are in abutting contact, comprising:

a. a source of light, with said source emitting a beam of light;

b. a light impervious member having a circular aperture, with said light impervious member so disposed forward of said light source that said emitted light beam impinges thereupon, and a portion of said emitted light beam enters into and passes through said aperture;

c. means for collimating and transmitting impinging light, with said means disposed so that said portion of said emitted light beam which passes through this aperture impinges upon said means;

d. a rotatable light diffuser disposed forward of, and in optical alignment with, said collimating and transmitting means;

e. means for selectively rotating said rotatable light diffuser;

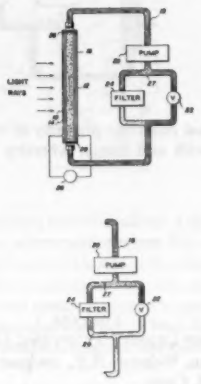
f. and, means, disposed forward of and in optical alignment with said rotatable light diffuser, for removably holding and supporting said transparency and said previously exposed light-sensitive recording medium in abutting contact, with said recording medium disposed forward of said transparency, and with said light-sensitive front surface of said recording medium facing rearwardly.

4,043,654

DISPLAY SYSTEM

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 114,794, Feb. 12, 1971, abandoned, which is a division of Ser. No. 746,177, July 19, 1968, Pat. No. 3,607,256. This application Apr. 9, 1973, Ser. No. 349,498
Int. Cl.[2] G03G *15/00, 17/04*
U.S. Cl. 355—3 P **6 Claims**



1. An electrophoretic light image display and/or recording device comprising an electrophoretic suspension layer inserted between two electrodes, one of which has a photoconductive layer coupled thereto and faced to said electrophoretic suspension layer means for applying an electric field between said two electrodes and means for irradiating light on said photoconductive layer so as to reduce the resistivity of said photoconductive layer, said electrophoretic suspension layer being selected from the group consisting of a suspension including at least one electrophoretic material suspended in a dark suspending medium the optical reflective property of said electrophoretic suspension layer being changeable with electrophoretic movement of said electrophoretic material upon application of said electric field during the reduction of the resistivity of said photoconductive layer.

4,043,655

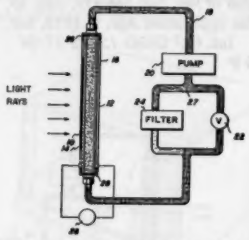
PHOTOELECTROPHORETIC IMAGE REPRODUCTION DEVICE

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 349,498, April 9, 1973, which is a continuation of Ser. No. 114,794, Feb. 12, 1971, abandoned, which is a division of Ser. No. 746,177, July 19, 1968, Pat. No. 3,607,256. This application July 26, 1973, Ser. No. 382,809
Int. Cl.[2] G03G *15/00, 17/04*
U.S. Cl. 355—3 P **9 Claims**

1. A photoelectrophoretic image reproduction device comprising an electrophoretic suspension layer having a dark suspending medium and at least one photosensitive electrophoretic material in a finely divided powder form suspended in said dark suspending medium, said suspension layer having two opposite major surfaces; a substantially transparent first electrode and a second electrode which are spaced from and opposed to each other and are positioned on said two opposite major surfaces of said suspension layer, respectively; means coupled to said electrodes to apply a D.C. electric field across the suspension layer between said electrodes; means operatively associated with said first electrode to expose said suspension layer to an image of actinic electromagnetic radiation

through said first electrode, said electric field and said image electrophoretically changing the spatial distribution of said at least one photosensitive electrophoretic material so as to



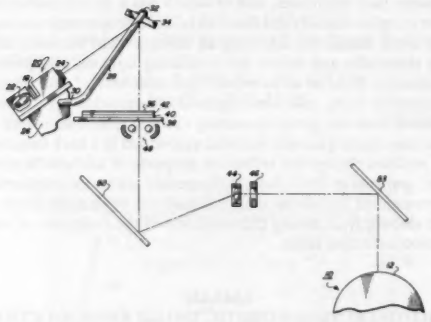
change the optical reflective property of the suspension layer in accordance with said image, whereby an image is reproduced.

4,043,656

TRANSPARENCY COPYING MACHINE

Abraham Cherian, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 3, 1976, Ser. No. 663,389
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 R **13 Claims**



1. An electrophotographic printing machine for reproducing a transparency or an opaque original document, including:

a receiving member;

a photoconductive member;

means for charging at least a portion of said photoconductive member to a substantially uniform level;

means for projecting a light image of the transparency;

means for modulating the light image of the transparency; and

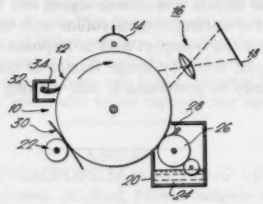
means for directing the light image of the transparency through said receiving member and said modulating means onto the charged portion of said photoconductive member selectively dissipating the charge thereon to record an electrostatic latent image thereof, said directing means being movable from a first position remote from the path of the transparency light image wherein the electrophotographic printing machine reproduces the opaque original document to a second position in the path of the transparency light image wherein the electrophotographic printing machine reproduces the transparency.

4,043,657

BLADE FOR METERING LIQUID DEVELOPER

Avinash R. Karnik, Welwyn, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 26, 1976, Ser. No. 652,448
Claims priority, application United Kingdom, Mar. 24, 1975, 12172/75
Int. Cl.² G03G *15/10*
U.S. Cl. 355—10 **4 Claims**



1. An apparatus for development of electrostatographic patterns on an imaging surface comprising:

a. an imaging surface;

b. a means for creating a charge pattern on the imaging surface and maintaining a development threshold within a range of about 60 v at operating temperatures of from about 10° to about 40° C;

c. a liquid developer applicator for presenting the liquid developer to the charge pattern, said applicator having a surface pattern of raised and recessed portions, said recessed portions being adapted to contain liquid developer and said raised portions being adapted to set up a frequency of from about 300 Hz to about 6,000 Hz in a doctor blade edge when in moving contact therewith; and

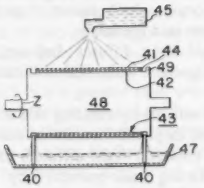
d. a blade for metering liquid developer in the applicator to the imaging surface, said blade being formed from a material having a complex modulus of elasticity value at 20° C and 700 Hz of from about 4 MN/m^2 to about 20 MN/m^2 which varies from that value by from about 3 MN/m^2 at temperature of about 40° C to about 7 MN/m^2 at temperatures of about 10° C but not less than a value of about 0.5 MN/m^2, said blade being urged against said applicator surface by a force of from about 25 gm/cm to about 250 gm/cm.

4,043,658

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

Shozo Inoue, Fussa, and Tadashi Sato, Kokubunji, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 487,308, July 10, 1974, abandoned, which is a continuation of Ser. No. 72,589, Sept. 16, 1970, abandoned. This application Oct. 9, 1975, Ser. No. 621,230
Claims priority, application Japan, Sept. 25, 1969, 44-76685
Int. Cl.² G03G *15/00*
U.S. Cl. 355—10 **6 Claims**



1. An electrophotographic apparatus comprising:

a rotatable electrophotographic member having an electro-

photographic photosensitive layer fixed on the periphery thereof, said electrophotographic photosensitive layer being for repeated use;

guiding means comprising a groove for preventing developing liquid from flowing outwardly of the laterial edges of said rotatable member and for guiding the developing liquid to a developing liquid reservoir, said groove being provided along at least one lateral end of said rotatable electrophotographic member;

means for forming an electrostatic latent image on said electrophotographic member;

means for developing an electrostatic latent image formed by said electrostatic latent image forming means;

means for transferring the image developed by said developing means.

4,043,659

CLEANING BLADE TONER ARRESTOR

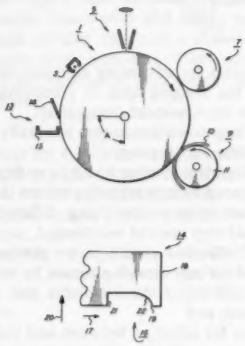
Lionel A. Wilson, AL, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 4, 1975, Ser. No. 565,319

Claims priority, application United Kingdom, May 24, 1974, 23707/74

Int. Cl.[2] G03G *21/00*

U.S. Cl. 355—15 **3 Claims**



1. An electrostatographic reproducing apparatus comprising: a movable support surface; means for forming a charge pattern on said surface; means for developing the charge pattern with liquid developer to form a developed image; means for transferring the developed image to a receiver member; said support surface being adapted to move in a given direction past each of said means in succession; and cleaning apparatus comprising a flexible cleaning blade having an edge positioned in contact with said surface, said cleaning blade having a recess solely in each of the ends of said edge, each of said recesses defining an opening which is arranged to face against the direction of support surface movement, and wherein edges formed by said recesses are positioned in contact with said surface.

4,043,660

DEVICE FOR CORRECTING POSITIVE FILM FOR PHOTOCOMPOSITION

Franz Adolf Wingerter, Berlin, Germany, assignor to H. Berthold AG, Berlin, Germany

Filed June 21, 1976, Ser. No. 697,989

Claims priority, application Germany, Aug. 19, 1975, 2537357

Int. Cl.[2] G03B *13/28, 27/32, 27/52*

U.S. Cl. 355—43 **10 Claims**

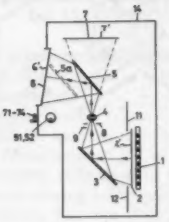
5. A device for correcting positive film for photocomposition comprising:

a housing, said housing containing means for holding an original film carrying a red-shaded area to delineate a defective area;

means for holding a final film in a recording plane;

means for manipulating a correction film to delineate a desired replacement character or characters to take the place of said red-shaded area in said final film; and

an optical system comprising two mirrors, a first convex lens



mirror and a second movable mirror, a single light source, an image plane where said original film and said correction film are alternately located, a focusing plane in which said original film is selectively located, and said recording plane, said optical system designed to project said desired replacement characters onto said final film by successive projections of first said original film and then said correction film.

4,043,661

ENLARGER-PRINTER

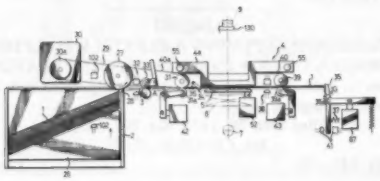
Hiroshi Yamada, Ichikawa; Yukio Shirai, Kawasaki, and Minolu Fukuda, Yokohama, all of Japan, assignors to Ricoh Co., Ltd., Japan

Filed Apr. 23, 1976, Ser. No. 679,760

Claims priority, application Japan, May 1, 1975, 50-52015; Dec. 8, 1975, 50-145066

Int. Cl.[2] G03B *27/48, 27/50, 27/32, 27/52*

U.S. Cl. 355—50 **15 Claims**

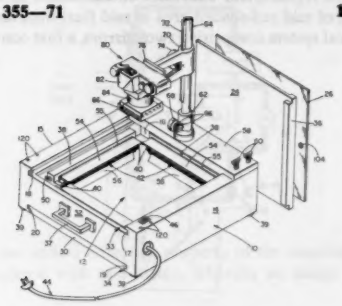


1. An enlarger-printer comprising, in combination, means operable to feed a card, standing on one of its major sides, in the direction in which the major sides of said card are oriented, said card mounting therein a film; a scanning device operable to effect scanning of said film in the direction in which the minor sides of said card are oriented, said scanning device comprising a scanner for carrying the card and scanner moving means operable to move said scanner in the direction in which the minor sides of the card are oriented; means operable to position the card in the scanning device after the card has been fed in the direction in which the major sides of the card are aligned; a film margin differences compensating device operable to move the card in the scanning direction for compensating for differences in the margins of films; a photosensitive member of a copying apparatus; an optical system operable to irradiate the film to form an enlarged image of the film on said photosensitive member; and a card ejection device operable to eject the card after the card has been scanned.

4,043,662
PHOTOGRAPHIC LIGHT SOURCE

Peter J. Garfall, 4 Greystone Road, Melrose, Mass. 02176

Filed Sept. 10, 1975, Ser. No. 612,012
Int. Cl.[2] G03B 27/76
U.S. Cl. 355—71 17 Claims

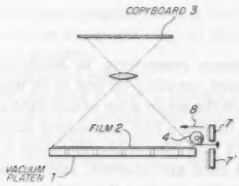


1. A photographic light source comprising:
a boxlike frame;
sockets for mounting and electrically connecting for continuous operation a plurality of fluorescent white light tubes distributed about the inner sides of said frame and extending longitudinally of said sides; and
reflectors with light diffusing reflecting surfaces mounted to extend between said sockets and about light tubes mounted therein and having a position relative to said tubes at which most of the light from the tubes is directed and reflected into the interior of said frame and mainly toward one face only thereof, so that an object to be photographed may disposed within and adjacent said one face of said frame and exposed to said directed and reflected light from the tubes and reflectors for photographing through the lens of a camera directed into the frame through the opposite face thereof;
said reflectors being at least in part adjustable about the axis of the light tubes with which they are associated and including reflector portions beyond said light tubes from said one face of said frame which are adjustable to a position in which their reflecting faces are substantially parallel to said one frame face.

4,043,663
DEVICE FOR APPLYING A FLEXIBLE HALFTONE SCREEN OVER A CAMERA VACUUM PLATEN

Juergen G. Lein, West Henrietta, N.Y., assignor to Itek Corporation, Lexington, Mass.

Filed Oct. 28, 1975, Ser. No. 625,997
Int. Cl.[2] G03B 27/60
U.S. Cl. 355—73 10 Claims

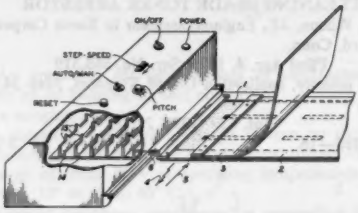


1. The device for applying and removing a flexible halftone screen from a vacuum platen portion of a camera comprising:
a. a roller having a first and second terminal portion;
b. a movable support frame for supporting rotatably said roller and having a first portion coupled to the first terminal portion of said roller and having a second portion coupled to the second terminal portion of said roller;
c. a flexible halftone screen wound about said roller a plurality of times when said roller is positioned at a first portion of said platen;
d. means for coupling a terminal portion of said screen to a fixed frame portion of said camera;
e. means for translating said movable support frame across said platen for causing said roller to rotate in a first direction to unwind said screen and cause it to be laid flat upon said platen; and
f. means for rotatably biasing said roller in a second direction opposite said first direction for causing said screen to be tightly wound about said roller.

4,043,664
INTERLINEAR FEEDER FOR COPYING MACHINE

Toshitsugu Kuwana, Mito, Japan, assignor to Rank Xerox Ltd., London, England

Filed June 21, 1976, Ser. No. 698,373
Claims priority, application Japan, July 16, 1975, 50-98589
Int. Cl.[2] G03B 27/62
U.S. Cl. 355—75 9 Claims

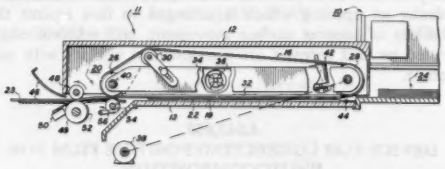


1. In an apparatus for advancing an image-bearing member in steps across the imaging area of a copying apparatus by drive means, the improvement comprising:
a plurality of step control members integrally movable with said image-bearing member,
each said step control member having a multiplicity of incrementally spaced switch actuating means thereon,
said switch actuating means being differently spaced on different said step control members;
a plurality of individual switch means positioned for actuation by said switch actuating means by movement of an individual said step control member past said individual switch means; and
selector means for selecting between said individual switch means and connecting the selected switch means with said drive means for controlling said drive means for a selected incremental step movement of said image-bearing member by said drive means.

4,043,665
COPIER DOCUMENT HANDLER

John R. Caldwell, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 26, 1975, Ser. No. 561,465
Int. Cl.[2] G03B 27/62, 27/64
U.S. Cl. 355—76 5 Claims



1. In a copying apparatus with a light-transmitting air-impervious document copying platen for copying of documents by manual placement of a document on a first side of said platen, and with optical imaging means for imaging of a document through said platen, and with an alternative mechanical document handling system for feeding documents onto and off of said first side of said platen for said imaging of a document, the improvement in said document handling system comprising:
vacuum belt means normally but removably overlying said

first side of said platen for transporting and retaining a document on said vacuum belt means over said first side of said platen without slippage between the document and said vacuum belt means; and

spacing means for maintaining said vacuum belt means slightly but continuously spaced from and overlying said first side of said platen for holding the document spaced from but within a predetermined distance from said platen;

said vacuum belt means being continuously spaced above said platen by said spacing means by a spacing which is slightly greater than the predetermined maximum thickness of the document to be copied on said platen to prevent substantial frictional engagement between the document and said platen and to prevent any contact between said vacuum belt and said platen;

wherein said optical imaging means has a limited optical depth of field extending slightly beyond said first side of said platen;

wherein said spacing means maintains said vacuum belt means spaced above said first side of said platen within said depth of field; and

wherein said document handling system includes document pre-registration means positioned off of said platen for pre-registering the edge of a document prior to its transport over said platen by said vacuum belt means, and

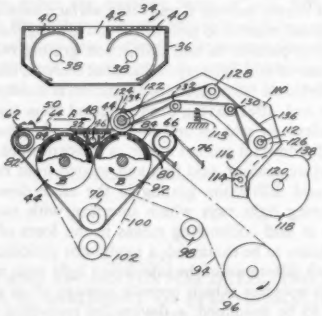
means for advancing said vacuum belt means from said pre-registration means over said platen without slippage between said vacuum belt means and the document to provide registration positioning of the document over said platen without registration engagement of the document over said platen.

4,043,666

ORIGINAL SHEET CARRYING AND ILLUMINATING DEVICE FOR USE IN ELECTROPHOTOGRAPHIC COPYING MACHINE

Masayoshi Furuichi, Tokyo, Japan, assignor to Kabushiki-Kaisha KIP, Tokyo, Japan

Filed Mar. 24, 1976, Ser. No. 670,073
Claims priority, application Japan, Apr. 1, 1975, 50-40156
Int. Cl.² G03B *27/70, 27/62*
U.S. Cl. 355—76 **5 Claims**



1. In an electrophotographic copying device having means for carrying an original sheet and light source means for illuminating said sheet, the original sheet carrying means comprising:

a first movable carrying means having clipping means for grasping the sheet at an initial position and transporting the sheet past a location at which the sheet is subjected to illumination from the light source means, said first carrying means transporting the sheet a distance which is less than the length of the sheet before moving in a return path towards said initial position during which movement said first carrying means is stopped; and

a second movable carrying means for pneumatically attracting and supporting said sheet as it passes said location, the portion of said second carrying means supporting the sheet being shorter than said distance along which the sheet is transported by the first carrying means.

4,043,667

METHOD AND SYSTEM FOR PRINTING PHOTOGRAPHS

Masaaki Machida, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1975, Ser. No. 569,797
Claims priority, application Japan, Apr. 27, 1974, 49-47136
Int. Cl.² G03B *27/04*
U.S. Cl. 355—97 **2 Claims**

1. A system for printing photographs from a negative film in which each frame on said negative film is assigned a different frame number comprising,

a. a first memory for storing frame numbers of the frames to be printed and the quantity of photographs to be printed of each said frame number,

b. a second memory connected to the first memory, said second memory storing information comprising numbers of frames existing between a reference position of the negative film and the required frame or frames,

c. means for reading the information in said second memory,

d. means for printing a selected number of photos of selected frames based on the information contained in said second memory, and

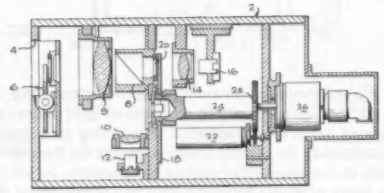
e. means for generating a signal representing an end portion of the negative film and means for discriminating whether the information of said required frame numbers memorized in said first memory coincides with the numbers counted on the basis of said end potion representing signal.

4,043,668

PORTABLE REFLECTANCE SPECTROMETER

Alexander F. H. Goetz, Altadena; Richard A. Graham, La Crescenta, and Tetsuo Ozawa, Gardena, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Mar. 24, 1975, Ser. No. 561,369
Int. Cl.² G01J *3/48*
U.S. Cl. 356—73 **10 Claims**



1. A reflectance spectrometer comprising:

optical means for detecting incident radiation reflected by a target area, said optical means including:

first detector means or providing signals indicative of total incident radiance:

second detector means for providing signals indicative of predetermined spectral radiance;

beam splitter means for directing a portion of said incident radiation towards said first and second detector means;

filter means for filtering the portion of said incident radiation directed on said second detector means, said filter means being a circular variable filter;

means for varying the position of said filter means with respect to incident radiation;

recording means for recording said signals provided by said first and second detectors, said recording means including:

first and second amplifying means respectively connected to said first and second detector means for amplifying said said signals provided therefrom;

automatic gain control means automatically controlling the gain of said first and second amplifiers as a function of the wavelength of spectral radiation passed through said filter means;

digital recorder means for recording in digital form data

represented by said signals from said first and second detectors;

voltage converter means for converting said signals from said first and second detectors from alternating current signals to direct current signals;

multiplexer means connected to said voltage converter means for selectively providing said signals from said first and second detectors for recordation by said digital recorder means; and

digital means connected to said multiplexer means for providing output signals therefrom to said digital recorder for recordation thereby; and

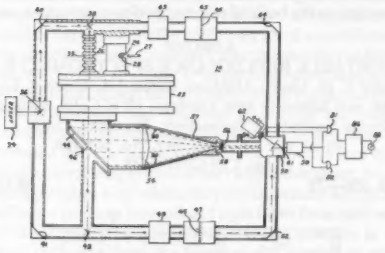
encoder means for providing encoder signals indicative of the position of said filter means with respect to incident radiation and the wavelength of spectral radiation passed through said filter means, said encoder signals being applied to said gain control means.

4,043,669

LIGHT SCATTERING TEST APPARATUS

Matatiahu Gehatia, and Donald R. Wiff, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 28, 1976, Ser. No. 691,162
Int. Cl.[2] G01N *21/00*
U.S. Cl. 356—104 **4 Claims**



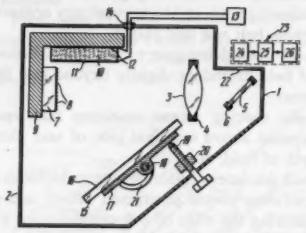
1. An apparatus for obtaining data for determining the ratio of scattered light intensity to unscattered light intensity from a sample of molecules in solution; comprising an elongated test cell containing the sample solution; means for maintaining said sample at a substantially constant temperature; means for passing a beam of monochromatic light in a longitudinal direction through said test cell; a photomultiplier; means for passing light scattered by said sample solution along a first light path toward said photomultiplier; means for passing unscattered light passing through said sample solution along a second path toward said photomultiplier; means for removing substantially all the scattered light from the sample solution, in said first path, except light scattered at a predetermined angle; means in said first and said second light paths for alternately passing light from the first and second light paths to said photomultiplier; a null indicating device connected to the output of said photomultiplier; means for attenuating the light in the unscattered light path to provide a null reading on said null meter; means for providing an indication of the attenuation needed to provide a null in the output of said photomultiplier, to thereby obtain data for determining the ratio of scattered light intensity to unscattered light intensity; said means for maintaining said sample at a substantially constant temperature including a constant temperature tank; a liquid coolant within said tank; a heat exchanger in the wall of said tank; means for supplying coolant to the heat exchanger; a turret assembly within said tank; a plurality of conical mirrors, each having a different cone angle, mounted on said turret assembly; means for rotating said turret assembly to selectively position one of said conical mirrors around the beam path of light passing through the test cell; each of said mirrors including means for holding the test cell.

4,043,670

SPECTROMETER AND METHOD OF EXAMINING SPECTRAL COMPOSITION OF LIGHT

Jury Georgievich Kozlov, Zheleznovodskaya ulitsa, 31, kv. 39, and Alexandr Iosifovich Lopatin, Aviagorodok, 10, kv. 9, both of Leningrad, U.S.S.R.

Filed June 11, 1975, Ser. No. 586,096
Claims priority, application U.S.S.R., June 13, 1974, 2033027
Int. Cl.[2] G01B *9/02*; G01J *3/00*
U.S. Cl. 356—106 S **10 Claims**



1. A spectrometer comprising: means defining an entrance aperture which permits passage of an incoming light beam to be examined; collimating means having a focal plane which is arranged so that said light beam being examined is incident thereon after passing through said entrance aperture; a diffraction grating having symmetrical rulings forming its working surface to define right and left diffraction orders, said diffraction grating being arranged so that the light beam being examined is incident thereon after passing through said collimating means, the light beam diffracting in said right and left diffraction orders into first and second light rays of a given wavelength; a first scanning mirror common to both said light rays, having a reflection surface and an axis of rotation, said first scanning mirror being arranged so that one of said light rays is incident thereon and, after having been reflected from said first scanning mirror, is incident again on said diffraction grating; a second mirror having a reflecting surface arranged generally orthogonal relative to said diffraction grating that its reflecting surface is parallel to said diffraction grating rulings, and the other one of said light rays is incident thereon, and after having been reflected from said second mirror, is incident on said first mirror and, after having been reflected from said first mirror, is incident on said second mirror and, after having been reflected from said second miror, is incident once again on said diffraction grating, said first and second light rays diffracting from said diffraction grating in the same direction to form interfering light rays which interfere with each other, and arrive at said collimating means in the form of the outgoing light beam to be examined; a modulator periodically changing the path difference of the interfering light rays; means defining an exit aperture which permits passage of an outgoing light beam to be examined; a device for recording said outgoing light beam located in said focal plane of said collimating means adapted to read the spectral composition of said light beam being examined.

4,043,671

LASER SYSTEM PRESET UNIT

William L. Goodwin, Knoxville, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

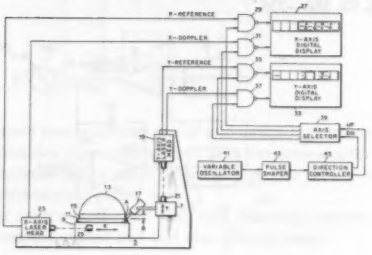
Filed July 13, 1976, Ser. No. 704,872
Int. Cl.[2] G01B *9/02*
U.S. Cl. 356—106 R **3 Claims**

1. In a Zeeman-effect laser interferometer system for mea-

suring displacement of an object along an axis including a laser head having a reference signal output for producing pulses at a fixed rate and a Doppler signal output for producing pulses at a rate greater than the rate of said fixed rate pulses for displacement in a forward direction and less than the rate of said fixed rate pulses for displacement in a reverse direction and a digital display unit for detecting differences in the Doppler signal rate relative to the pulse rate of said reference signal for calculating and displaying the displacement of said object along said axis from a reference point, a display preset circuit, comprising:

a selectable frequency oscillator;

pulse-shaping means connected to the output of said oscillator for generating a fixed period pulse at an output thereof at a repetition rate equal to the frequency of said oscilla-



tor, said fixed period being substantially equal to the period of said reference signal and said Doppler signal;

a first gating means having an enabling input for coupling the reference signal output of said laser head to the reference signal input of said display unit;

a second gating means having enabling input for coupling the Doppler signal output of said laser head to the Doppler signal input of said display unit; and

switching means for selectively applying said fixed period pulses to either the enabling input of said first gating means or the enabling input of said second gating means so that the selected gate is disabled for at least the period of one reference or Doppler pulse for each fixed period pulse until the valve to be preset into the display unit is obtained

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4,043,672

METHOD AND APPARATUS FOR DETECTING THE DIRECTION OF INCIDENCE OF ELECTROMAGNETIC RADIATION

Viktor Baumgartner, Taufkirchen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed July 15, 1976, Ser. No. 705,707

Claims priority, application Germany, July 25, 1975, 2533214

Int. Cl.[2] G01B *11/26*

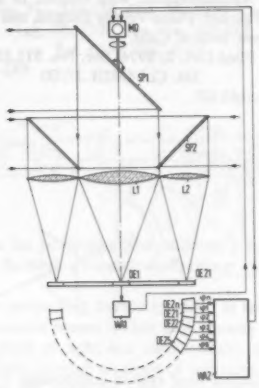
U.S. Cl. 356—152 **24 Claims**

1. A method of detecting the direction of incidence of electromagnetic radiation with the help of two coaxial optical receiving systems a first one of which is fixed and the other one of which is rotatable, comprising the steps of:

receiving and detecting the general angle of incidence of electromagnetic radiation with the first receiving system;

coarsely rotating the other receiving system to the general angle of incidence;

directionally receiving and detecting the angle of incidence with the other receiving system; and



accurately positioning the other receiving system, as a fine adjustment, to the angle of incidence.

4,043,673

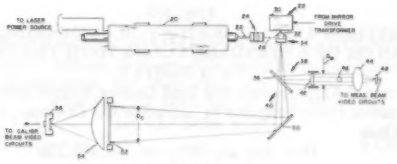
RETICLE CALIBRATED DIAMETER GAUGE

David E. Harris; Robert M. Watson, and John D. Redmyer, all of Columbus, Ohio, assignors to Autech Corporation, Worthington, Ohio

Filed Apr. 9, 1975, Ser. No. 566,413

Int. Cl.[2] G01B *11/10*

U.S. Cl. 356—160 **24 Claims**

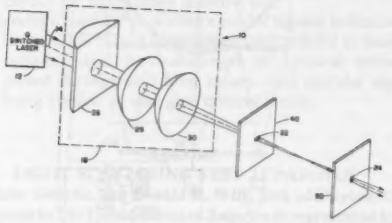


1. An optical gauging system comprising: a laser; a mirror positioned in the path of the laser beam, and means for oscillating said mirror to periodically change the angle of incidence of the laser beam to produce a periodic scan; beam splitter means for splitting the scanned beam into a measuring beam and a calibration beam; a collimating lens in the path of said reflected beam to produce a beam, with a parallel scan said collimating lens positioned to direct said collimated parallel scanning beam onto an object with the beam scan in the direction of a dimension of the object which is to be measured; means for generating a measuring signal representative of the portion of the scan cycle during which the object occults the measuring beam; calibrating means including a reticle positioned in the path of the calibration beam for alternately occulting and transmitting said beam as it sweeps said reticle, wherein the distance swept by the calibration beam in the plane of the reticle is larger than the distance swept by the parallel scanning measuring beam in the plane of the object; a lens positioned beyond said reticle and a photodetector positioned at the focal point of said lens whereby the output of said photodetector is a spatially periodic electrical signal representative of the reticle band pattern; and means responsive to said measuring signal for counting the number of calibrating pulses generated while said measuring beam is occulted by the object under inspection.

4,043,674
SPATIAL FILTER FOR Q-SWITCHED LASERS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Ralph F. Wuerker, Palos Verdes Estates, and Lee O. Heflinger, Torrance, both of Calif.

Filed Oct. 2, 1974, Ser. No. 511,334
Int. Cl.[2] G02B 27/00
U.S. Cl. 350—162 SF 3 Claims

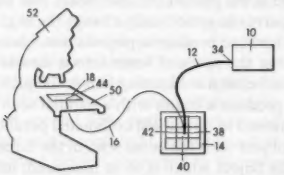


1. A Q-switched laser system comprising:
a. a Q-switched laser emanating a beam of light along an optical path,
b. means disposed in said optical path for producing an astigmatic focus of said beam of light wherein said beam is focused on a first line traverse to said beam at a first position along said beam and is focused on a second line traverse to said beam and perpendicular to said first line at a second position along said beam, and
c. a spatial filter comprising a first light-opaque plate having a slit therein and disposed traversely to said beam at said first position, said slit being substantially in register with said first line and a second light-opaque plate having a slit therein and disposed traversely to said beam at said second position, said slit of said second plate being substantially in register with said second line.

4,043,675
METHOD AND APPARATUS FOR COMPARING THE COLOR OF A STANDARD COLOR WITH THE COLOR OF A SAMPLE

Gottfried Kurt Guennel, and Fred Charles Trusell, both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Apr. 26, 1976, Ser. No. 680,258
Int. Cl.[2] G01J 3/52
U.S. Cl. 356—191 8 Claims

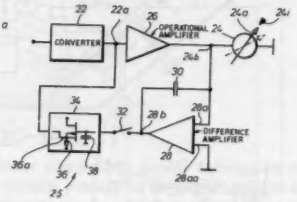


1. Apparatus for displaying the color of an individual standard color of a color standard adjacent a sample, for direct comparison of the color of the standard color with the color of a sample comprising:
a. a light source;
b. an optic fiber bundle for receiving light from the light source and projecting the light on an individual standard color of a color standard, the optic fiber bundle having a light receiving end positioned to receive light from the light source and a light projecting end positioned in close proximity with the individual standard color to project light from the light source thereon; and
c. an optic fiber for receiving light reflected from the standard color and transmitting the reflected light, the optic fiber having a light receiving end positioned in close proximity with the standard color of the color standard to receive light reflected therefrom and a light projecting end positioned adjacent the sample for direct comparison of the color of the light transmitted by the optic fiber with the color of the sample.

4,043,676
PHOTOMETER

Otto Holzinger, and Wilhelm Pross, both of Munich, Germany, assignors to Carl Zeiss Stiftung, Heidenheim (Brenz), Germany

Filed July 18, 1975, Ser. No. 597,291
Claims priority, application Germany, July 25, 1974, 2435908
Int. Cl.[2] G01J 1/44
U.S. Cl. 356—226 6 Claims



1. A photometer having a light source for use with plural substance holding means for holding the same or different substances to facilitate a measuring of the light transparency of said substance or substances, comprising:
a photoelement having a characteristic of producing a variable signal proportional to the amount of light being received thereby and which is transmitted through a calibration substance;
converter means responsive to said signal for converting said signal to a logarithmated signal;
amplifier means responsive to said logarithmated signal for amplifying said logarithmated signal;
indicator means responsive to said amplified signal for indicating the magnitude of said amplified signal; and
control circuit means connected in parallel with said amplifier means and including storage means for storing a signal equal in magnitude but opposite in polarity, to said logarithmated signal, said control circuit means further including switching means for isolating said storage means from the output of said amplifier means while simultaneously supplying said stored signal to the input to said amplifier means to cause said indicator means to indicate a zero signal value indicative of the light transparency of said calibration substance whereby a second logarithmated signal produced by said converter means for another different substance will cause said indicator means to indicate the difference between said storage signal and said second logarithmated signal and thereby the difference in light transparency between said calibration substance and said different substance.

4,043,677
EXPOSURE METER

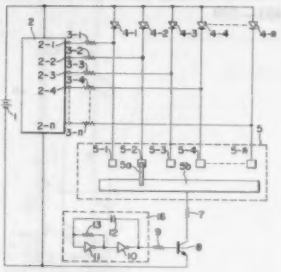
Kenji Toyoda, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 9, 1975, Ser. No. 639,176
Claims priority, application Japan, Dec. 28, 1974, 50-1295
Int. Cl.[2] G01J 1/42; G03B 17/20
U.S. Cl. 356—227 14 Claims

1. Exposure meter for camera comprising:
indicating means including a plurality of indicating elements,

each of which indicates shutter time or stop value in the operative condition thereof;

photometric means for causing one of said indicating elements to be operative to indicate at least one exposure factor in correspondence with the intensity of light from an object to be photographed and with manually set exposure factors;



changeover means causing one of said indicating elements to be operative in correspondence with the manual setting of an exposure factor other than said exposure factors set in the photometric means; and

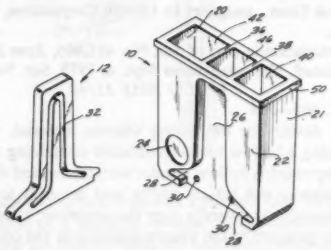
a power source connected with said indicating means, said photometric means and said changeover means.

4,043,678

CUVETTE

Gregory A. Farrell, and Abraham Gordon, both of Teaneck, N.J., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,642
Int. Cl.² G01N 1/10
U.S. Cl. 356—246 **18 Claims**



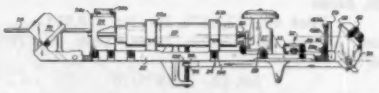
1. A cuvette body, comprising: means defining first and second upright laterally-spaced liguid-receiving chambers at least one of which has an inlet, passageway means interconnecting lower portions of said chambers, said passageway means having a horizontal cross-section of greatest dimension substantially less than the horizontal cross-section of smallest dimension of either of said chambers and sufficient to normally allow substantially free flow of liquid between said chambers, said passageway means being of inverted U-shape and having an effective height to normally isolate the contents of said chambers.

4,043,679

SELF-LEVELING CONSTRUCTION ALIGNMENT LASER

Lyndell J. C. George, and Robert S. Shelly, both of Jacksonville, Ark., assignors to AGL Corporation, Jacksonville, Ark.

Division of Ser. No. 624,238, Oct. 20, 1975. This application Aug. 30, 1976, Ser. No. 718,612
Int. Cl.² G01C 9/18
U.S. Cl. 356—249 **2 Claims**



1. A system for projecting and utilizing a light beam as a reference line for laying conduit comprising:

a housing;

a light beam projecting device mounted in said housing;

light compensator means within said housing for intercepting said beam of light and automatically deflecting said beam of light through an angle of $n\phi$ when the longitudinal axis of the beam of light projected from the light projecting device is tilted at an angle of ϕ from true horizontal, said compensator having a liquid-air interface remaining parallel to true horizontal to provide compensation;

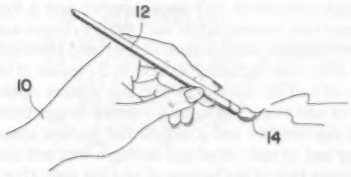
a shield member mounted within said housing on the opposite side of the light compensating means from said light beam projecting device and having an aperture therein aligned with the path of the undeflected beam of light projected from said light beam projecting device through said light compensator means, the aperture within said shield being of a predetermined size to prevent the passage of the beam of light therethrough when the beam of light projected by the light beam projecting device deviates a predetermined angle from true horizontal.

4,043,680

ARTIST'S BRUSH WITH DISPOSABLE CARTRIDGE

Lawrence V. Milano, Yonkers, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed June 15, 1976, Ser. No. 696,358
Int. Cl.² B43K 5/02
U.S. Cl. 401—40 **8 Claims**



1. An artists brush with disposable cartridge, comprising:

a shaft,

a plunger slidingly insertable in a distal end of the shaft,

a first disk mounted in the shaft below the plunger and forming a medium storing chamber above the first disk,

a second disk mounted in the shaft below the first disk and forming a pigment storing chamber between the first disk and the second disk and forming a dispensing chamber below the other disk,

means for introducing the medium through the disk and into the pigment chamber,

means of dispensing the pigment and medium through the other disk into the dispensing chamber,

a tip removably attachable to a proximal end of the shaft, thereby closing the dispensing chamber, and

covering means removably attachable over the tip.

4,043,681

WRITING INSTRUMENT

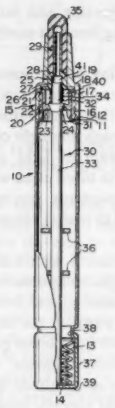
Takaji Funahashi, No. 1, 2-chome, Kitatakasho, Nishi, Nagoya, Aichi, Japan

Filed Aug. 12, 1976, Ser. No. 713,913

Claims priority, application Japan, Sept. 22, 1975, 50-129866[U]

Int. Cl.[2] B43K *5/10*

U.S. Cl. 401—151 **1 Claim**



1. A writing instrument comprising (a) an ink tank having a flexible bellows portion and having an opening at one end and a bottom at the other end, (b) a neck member including a first cylinder closely fitted on the outside of said one end of the ink tank and a second cylinder connected to said first cylinder and having an inner diameter smaller than that of the first cylinder, (c) a lid member having a peripheral edge portion disposed in the first cylinder of said neck member and having a valve seat hole at the center thereof, (d) a cap member including a flange disposed in the first cylinder of said neck member, a third cylinder connected to said flange and fitted closely in the second cylinder of said neck member and a fine liquid discharge tube connected to said third cylinder and having an inner diameter smaller than that of said third cylinder, (e) a valve member including a valve to be seated in the valve seat hole of said lid member, a first rod portion connected to one end of said valve and loosely inserted in said third cylinder of said cap member and a second rod portion connected to the other end of said valve and having a free end contacted with the inner face of the bottom of said ink tank, (f) a compression spring interposed between the free end face of said third cylinder of said cap member and said one end of said valve to seat said valve in said valve seat hole, and (g) a tubular writing core composed of an ink-absorbing material and having one end fitted and inserted between said second cylinder of said neck member and the fine liquid discharge tube and having the other end closed, wherein the peripheral edge portion of said lid member and the flange of said cap member are supported and held by the open end portion of said ink tank and the first cylinder of said neck member, whereby a first chamber is formed among said lid member, the free end face of the third cylinder and the first rod portion of said valve member and a second chamber is formed between the free end face of the first rod portion of said valve member and the third cylinder of said cap member.

4,043,682

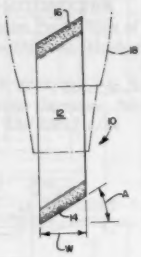
WRITING NIB STRUCTURE AND METHOD OF MANUFACTURE

John E. McDaniel, Douglasville, and Harold B. Morris, Newman, both of Ga., assignors to Glasrock Products, Inc., Fairburn, Ga.

Continuation of Ser. No. 586,593, June 13, 1975, abandoned. This application Sept. 8, 1976, Ser. No. 721,497

Int. Cl.[2] B43K *8/00*

U.S. Cl. 401—199 **3 Claims**



1. A writing nib comprising:

an elongated nib body of generally rectangular cross-sectional configuration to establish two pairs of opposite side surfaces extending between opposite ends of the body, said body having a layered construction to include a pair of relatively rigid reinforcing layers of plastic material coextensive with one of said pair of opposite side surfaces and a central layer of relatively soft wicking material of porous thermoplastic material sandwiched between and secured uniformly to said reinforcing layers and coextensive therewith, said wicking material being exposed along the length of said other pair of opposite side surfaces and projecting beyond said reinforcing layers on at least one end of said body to establish a writing tip.

4,043,683

DISPENSING AND WIPING DEVICE

Charles R. Costa, Plainville, and Robert L. Smigel, Middletown, both of Conn., assignors to Loctite Corporation, Newington, Conn.

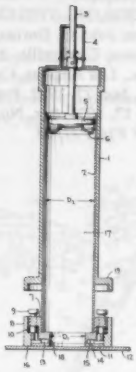
Continuation-in-part of Ser. No. 481,005, June 20, 1974, abandoned. This application Sept. 4, 1975, Ser. No. 610,347

Int. Cl.[2] B41F *15/40*

U.S. Cl. 401—264 **10 Claims**

1. A device for dispensing viscous material, said device comprising a hollow tubular container containing the material to be dispensed; a hollow tubular sleeve mounted slidably over the container and which causes said material to be exuded when forced downwardly over the container; a feeding means to apply pressure to the viscous material in the container, said feeding means being mounted on one end of the sleeve and which applies said pressure by advancing into the container; an application means to dispense the viscous material onto an abutting surface and to seal against and wipe said surface, said application means being sealingly mounted on the container at the opposite end of the device from the feeding means, said application means containing a restorable expansion space having biasing means therein to relieve exuding forces in the viscous material, and said application means also having a flexible lower surface with at least one perforation therethrough which communicates with the interior of the container, which flexible surface is caused to be deflected downwardly in the area surrounding the perforation when the sleeve

is forced downwardly over the container, and wherein said expansion space is restored by action of said biasing means



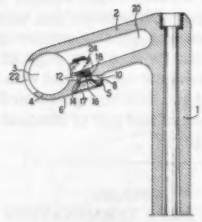
when the downward force on the sleeve is at least partially released.

4,043,684

HANDLE-BAR STEM

Bernard Lacroix, Montbeliard, France, assignor to Cycles Peugeot, Valentigney, France

Filed June 29, 1976, Ser. No. 700,926
Claims priority, application France, July 11, 1975, 75.21919
Int. Cl.[2] B62K *21/18*
U.S. Cl. 403—8 **4 Claims**



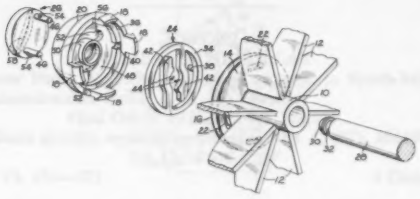
1. A handle-bar stem comprising a plunger tube for insertion in a fork tube of a wheeled vehicle, an extension extending laterally from the plunger tube, the extension carrying a collar defining a transverse aperture for receiving a handle-bar at an end of the extension remote from the plunger tube, a clamping lug extending from the collar toward the plunger tube and having an upper face, the extension having a lower face which defines with said upper face a slot extending through the collar into said aperture so that the collar is a split collar, the extension having an axial cavity and means defining an opening in the collar substantially in alignment with said cavity, and clamping means having a first end portion engaged in said cavity and an opposite second end portion engaged with said lug for urging said upper face and lower face toward each other and thereby clamping the collar around the handle-bar in said aperture.

4,043,685

FASTENERS

Joseph Edward Hyams, Solihull, England, assignor to Vic-Tree (Mouldings) Limited, Birmingham, England

Filed Oct. 10, 1975, Ser. No. 621,494
Claims priority, application United Kingdom, Oct. 22, 1974, 45752/74
Int. Cl.[2] F16D *1/00*
U.S. Cl. 403—19 **4 Claims**



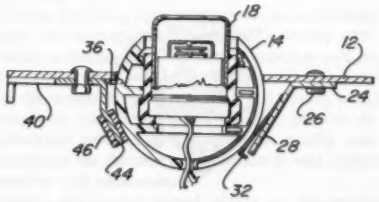
1. A fastener comprising a locking plate and a stud with a lateral recess, the plate including a frame and at least one post projecting from the frame to extend generally laterally of the stud and engage in the recess when the plate and stud are connected, said post being resilient so that when deflected out of the recess for release or disengagement, it will return to the engaged position; a cover in which the frame is located; a release plate having a number of pegs arranged to deflect the post when the release plate is turned, the release plate being secured to the cover by projections from the pegs; the cover having slots for movement of the pegs, and the slots having enlargements to allow the projections to pass through in assembly, the arrangement being such as to prevent the projections returning to the enlargements in normal use.

4,043,686

STABILIZED BALL JOINT

Kenneth R. Hackett, Boulder, Colo., assignor to Snotrix Division of Pittway Corporation, Boulder, Colo.

Filed June 3, 1976, Ser. No. 692,593
Int. Cl.[2] F16C *11/06*
U.S. Cl. 403—90 **3 Claims**



1. A ball joint mounting for a device to be selectively positioned and immobilized which comprises:

a base plate having a circular opening therein;

ball means positioned in said opening and having means for supporting a device thereon said ball being of a diameter enough larger than the opening to be retained thereby;

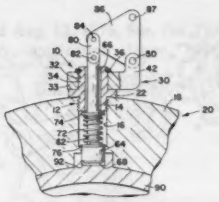
bias means attached to the base plate urging said ball means into said opening; and,

locking means pivotally mounted on said base plate and having a depending finger adapted to be pivotally moved into engagement with said ball means to lock said ball means against movement therebetween and said opening wherein said finger of said locking means is provided with resilient elastomeric means engaging said ball.

4,043,687
LATCHED TELESCOPING MEMBERS

William A. Van Dyke, Jr., Satellite Beach, Fla.; Frank S. Baker, Londonderry, N.H., and Robert McClintock, Framingham, Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 12, 1976, Ser. No. 676,072
Int. Cl.[2] F16B 7/10
U.S. Cl. 403—109 1 Claim



1. A locking mechanism for rigidly locking two telescoping members against relative movement comprising:

a bushing threaded into a bore in one of said members,

a pin having a stem portion slideably received within said bushing and a head portion adapted to project into a bore in the second of said members,

spring means surrounding said stem portion of said pin and confined between said head portion and said bushing,

a bracket rotatably mounted on the outer portion of said bushing,

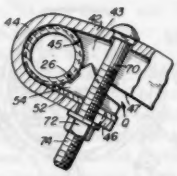
a triangular retracting plate pivotally mounted at one of its corners to said bracket and connected to another of its corners to the end of the stem portion of said pin, and

means connected to the third corner of said plate for rotating the same about the corner pivoted to said bracket to retract said pin.

4,043,688
BICYCLE STEM

Robert F. Humlong, Maysville, Ky., assignor to Wald Manufacturing Company, Inc., Maysville, Ky.

Filed Sept. 24, 1975, Ser. No. 616,265
Int. Cl.[2] F16G 11/00
U.S. Cl. 403—209 10 Claims

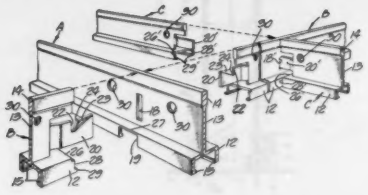


1. A bicycle stem comprising an elongate barrel, the upper end which terminates in a forwardly projecting, integral U-shaped loop defined by an upper, an outer, and a movable lower leg disposed in spaced relationship with said upper leg defining therewith an open throat through which a bicycle handlebar can pass, said upper leg having depending leg side walls thereon; a locking member removably seated on said lower leg to be spaced apart from said upper leg and disposed in said throat between said upper and lower legs; said locking member having a base and member side walls; said upper and lower legs and said locking member each having a bolt-receptive aperture therethrough; a bolt passing through said bolt-receptive apertures; and means for tightening the bolt to advance the lower leg toward the upper leg and simultaneously advance the locking member toward the outer leg of the loop with said locking member side walls loosely disposed between said leg side walls.

4,043,689
MODULAR CEILING SYSTEM

William H. Spencer, La Verne; John O. Dorius, Pasadena, both of Calif., and James D. Brown, Clarksville, Ark., assignors to Trend Ceilings Systems Co., Los Angeles, Calif.

Division of Ser. No. 221,143, Jan. 27, 1972, Pat. No. 3,949,533.
This application Feb. 17, 1976, Ser. No. 658,481
Int. Cl.[2] F16B 21/08
U.S. Cl. 403—252 22 Claims



1. In combination, a ceiling grid joint assembly comprising a first continuous lightweight extruded stringer of T-shape in cross-section and characterized by a channel shaped T-head having an open side facing away from and lying in a plane normal to the T-stem portion thereof, said T-stem portion having rectangular opening therethrough with its longer dimension extending normal to the web of said channel shaped T-head and its shorter dimension corresponding to double the thickness of said T-stem portion, the sidewalls of said T-head having identical notches in direct alignment with one another crosswise of said T-head in an area opposite the adjacent end of said rectangular opening, said notches having a depth flush with the interior bottom surface of the web of said T-head and a width corresponding to the distance between the exterior sidewall surfaces of said T-head, second and third stringers of the same size and shape as said first stringer and interlocked therewith from the opposite sides of said first stringer, said second and third stringers each being formed in the T-stem portion thereof with a latching tongue inserted one from either side of said first stringer with said latching tongues lying side by said through rectangular opening and having tabs having interlocking engagement with a rim edge of the adjacent longer side of said rectangular opening and with the ends of the T-heads of said second and third stringers seated in an adjacent one of an associated one of said pair of identical notches in the T-head of said first stringer.

4,043,690
WIRE ROPE TERMINATION

William R. K. Browne, York, Maine, assignor to York Engineering, Inc., York Harbor, Maine

Continuation of Ser. No. 608,709, Aug. 28, 1975, abandoned.
This application Feb. 2, 1976, Ser. No. 654,036
Int. Cl.[2] B25G 3/34
U.S. Cl. 403—268 9 Claims

1. A method of terminating a cable composed of a multiplicity of wires each preformed with a helical twist comprising the steps of

A. gripping the cable at a selected point near as end portion thereof to be terminated,

B. unlaying the end portion of the cable with a minimum of distortion of each unlaid wire from the laid shape so that the outermost cable wires each naturally reassumes its preformed helical twist about an axis that is different from those of the other wires whereby the wires in said portion together form an envelope that is symmetrical about the cable portion axis and has a radial bulge adjacent its inner

end, a radial flare at its outer end and a radial constriction intermediate its ends,

C. providing a sleeve with a tapered bore whose length and whose major and minor diameters are related to the envelope dimensions so that when the end portion is positioned in the sleeve with the envelope axis aligned with the bore axis

1. the envelope bulge is positioned adjacent the smaller end of the bore,

2. the envelope flare is positioned adjacent the larger end of the bore, and

3. the flaring wire ends lie against and are distributed around the bore wall,

D. arranging the cable end portion inside the sleeve bore so that the envelope axis substantially coincides with the bore axis, and

E. filling the sleeve bore with a settable resin material so that it surrounds the unlaid wires forming a solid tapered plug extending both inside and outside the entire length of the envelope formed by those wires that will wedge against the bore wall when a tensile force is applied between the sleeve and the cable.

4,043,691

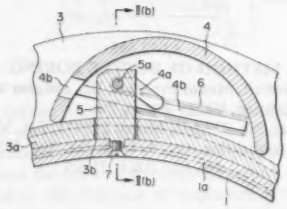
DEVICE FOR LOCKING A BODY TO BE MOUNTED

Kunihiro Fukino, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 20, 1976, Ser. No. 650,785

Int. Cl.² F16B *21/00*; F16L *37/00*; G02B *7/02*

U.S. Cl. 403—322 **6 Claims**



1. A locking device for releasably connecting a mounting body having a cylindrical end portion defined by a wall projected therefrom with a body having a projected end formed with a mating portion, the device comprising:

a. an engaging member having an engaging portion engageable with the mating portion of the body, the engaging member being movable between a first position where the engaging member closely contacts a side of the wall so that the engaging portion is in engagement with the mating portion and a second position where the engaging portion is released from said mating portion so that the mounting body is disengageable from the body;

b. a connecting member extending through said wall and mounted for sliding movement, one end of the connecting member being secured to said engaging member;

c. a projecting pin provided at the other end of the connecting member; and

d. an operating member slidably mounted relative to said wall, the operating member having a groove inclined relative to the sliding direction of the operating member and engageable with said projecting pin so as to move the engaging member between the first and second positions when the operating member slidably moves.

4,043,692

AXIAL THRUST COLLAR

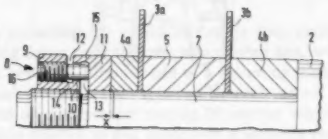
Werner Hund, Esslingen, Germany, assignor to Spieth-Maschinenelemente GmbH & Co. Kg, Germany

Filed Oct. 4, 1976, Ser. No. 729,073

Claims priority, application Germany, Oct. 4, 1975, 2544498

Int. Cl.² F16B *7/04*

U.S. Cl. 403—373 **3 Claims**



1. A threaded collar for use with a cylindrical member having a smooth portion and a threaded end portion for axially clamping members carried by said smooth portion, said collar comprising

a generally cylindrical body having an axial cylindrical bore therethrough and having inner and outer peripheral surfaces;

means in said body for defining a radially inwardly extending annular groove and a radially outwardly extending groove,

said grooves being axially spaced apart to define an attachment ring on said body, an intermediate ring between said grooves and an adjusting ring at an end of said body,

said intermediate ring having an axial dimension which is significantly smaller than said attachment ring and said adjusting ring,

said means including connecting portions at the inner and outer limits, respectively, of said inwardly and outwardly extending grooves interconnecting said rings,

said adjusting ring having a distal end surface for contacting the members to be clamped and having a smooth peripheral surface facing the smooth portion of said cylindrical member dimensioned to axially pass the threads on the threaded end portion of said cylindrical member with clearance;

substantially continuous thread means on the peripheral surface common to said attachment ring, said intermediate ring and the connecting portion therebetween for engaging the threaded end portion of said body;

a plurality of screws having externally threaded portions;

means in said attachment ring defining a plurality of internally threaded, circularly spaced, axially extending openings through said attachment ring for receiving said screws and engaging said threaded portions thereof; and

means in said intermediate ring defining a plurality of openings axially aligned with said openings in said attachment ring for permitting passage therethrough of said screws,

said screws being adjustable in said attachment ring to abut said adjusting ring and to elastically lengthen said body whereby adjustable axial clamping force can be exerted on the members carried by said cylindrical member.

4,043,693

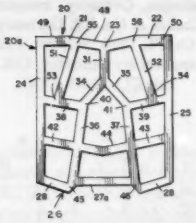
BRIDGE JOINT SEALS

Delmont D. Brown, North Baltimore, Ohio, assignor to The D. S. Brown Company, North Baltimore, Ohio

Continuation of Ser. No. 282,259, Aug. 21, 1972, abandoned, which is a division of Ser. No. 43,317, June 4, 1970, Pat. No. 3,687,022. This application Mar. 24, 1976, Ser. No. 669,843

Int. Cl.[2] E01C *11/10*

U.S. Cl. 404—64 5 Claims



1. A hollow, elongated elastomer seal useful for sealing pavement joints and bridge joints comprising an elongated, elastomer top wall; an elongated, substantially planar or shallow V-shaped, elastomer bottom wall; elongated, elastomer side walls joined at their longitudinal edges with said top and bottom walls; said top wall having a concave medial segment and substantially horizontal edge segments; and an internal, elastomer web structure characterized by a pair of transversely downwardly diverging, elongated, elastomer webs having their apex substantially vertically aligned with the longitudinal midportion of said bottom wall, means joining said apex with the longitudinal midportion of said top wall; a pair of transversely laterally extending, elongated elastomer webs joined at their longitudinal edges respectively with one of said diverging webs near said apex and one of said side walls; and an additional pair of webs extending respectively diagonally outwardly and downwardly between (a) intermediate portions of said top wall at the respective lines of juncture of said medial segment and said edge segments and (b) respective intermediate portions of said laterally extending internal webs with the respective intersections of said additional webs and said respective laterally extending internal webs being closer to the respective side walls than to the respective junctures of said last-mentioned internal webs and said diverging webs, the spacing ratio of the respective intersections of said additional webs and said intermediate portions, relative to said side walls and to said diverging webs, being in the range of 1:3 and 1:4, whereby the web structure and orientation of said webs provide resistance to inward rolling of the upper longitudinal corners of the seal away from the joint faces when the seal is seated under lateral compression in a joint, the bottom wall of said seal comprising a longitudinal midportion connected to the lower longitudinal edges of said side walls by elongated, respective V-shaped foot portions adapted to fold into substantially V-shaped transverse cross section when said seal is collapsed laterally, said foot portions respectively being composed of a first segment sloping downwardly from the respective lower longitudinal edges of said side walls and a second segment of more acute downward slope extending downwardly from the respective longitudinal edges of said longitudinal midportions.

4,043,694

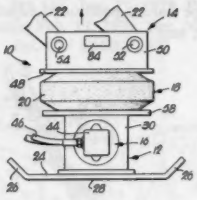
VIBRATORY COMPACTOR

Larry P. Mullen, Salina, Kans., assignor to Scientific Engineering, Inc., Salina, Kans.

Continuation-in-part of Ser. No. 587,218, June 16, 1975, abandoned. This application May 24, 1976, Ser. No. 688,968

Int. Cl.[2] E01C *19/34*

U.S. Cl. 404—133 12 Claims



1. Compacting apparatus, comprising:

compacting structure presenting a compacting foot;

attachment means spaced from said compacting structure for securing the apparatus to support structure therefor;

means operatively coupling said attachment means and compacting structure and supporting the latter and permitting cushioned, shock-absorbing relative motion therebetween,

said coupling and supporting means including a resilient, air-filled bag situated between said attachment means and compacting structure and in operative, shock-engaging engagement with the latter for absorbing at least a portion of the vibratory forces experienced during contact between said surface and an area being compacted,

there being valve means operatively connected with said bag for allowing self-inflation of said bag with atmospheric air and

means operatively coupled to said compacting structure for causing reciprocation of the same in a direction generally toward and away from said attachment means,

the volume of said bag, and the mass of said compacting structure, being of relative magnitudes for causing extension of the bag under the influence of said mass when the compacting structure is elevated above said area being compacted to permit air to pass into said bag from the atmosphere through said valve means, and for absorbing shocks when said compacting foot strikes said area being compacted.

4,043,695

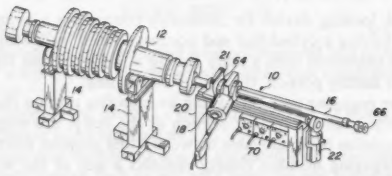
METHOD OF BOTTLE BORING

Herbert R. Gottelt, Mount Prospect, Ill., assignor to Alco Standard Corporation, Valley Forge, Pa.

Division of Ser. No. 337,671, March 2, 1973, Pat. No. 3,854,839. This application Aug. 1, 1974, Ser. No. 493,787

Int. Cl.[2] B23B *35/00*

U.S. Cl. 408—1 R 3 Claims



1. A method of bottle boring comprising:

conveying bottle boring apparatus to the location of a stationary object having a bore:

mounting the bottle boring apparatus adjacent an open end

of the bore, with the apparatus accurately positioned with respect to the axis of the bore;

inserting a cutting tool into an intermediate portion, which is to be enlarged, of the bore of the stationary object, while maintaining the open end portion of the bore at the original size;

extending a boring drive shaft, which rotates the cutting tool, from the bottle boring apparatus in a cantilever fashion;

supporting the boring drive shaft on a bearing in the portion of the bore at the original size to accurately position the cutting tool with respect to the axis of the bore at all points along the bore;

selecting a radial position of the cutting tool at a point external to the bore, while the cutting tool is in the bore;

controlling the radial position of the cutting tool with accuracy and precision in response to the selecting of the desired radial position thereof;

moving the cutting tool in an axial direction through a desired length of the intermediate portion of the bore; and

rotating the cutting tool with respect to the stationary object to selectively enlarge the intermediate portion of the bore up to more than twice the original size of the bore.

4,043,696

MICROMETER BORING HEAD

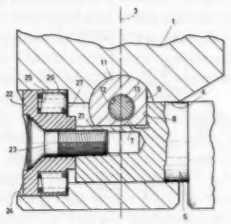
Gerhard Wohlhaupter, Frickenhausen, Germany, assignor to Emil Wohlhaupter u. Co., Frickenhousen, Germany

Filed Dec. 18, 1975, Ser. No. 641,942

Claims priority, application Germany, Dec. 19, 1974, 2460028

Int. Cl.² B23B *51/00*

U.S. Cl. 408—179 **3 Claims**



1. In a cutting tool rotatable about an axis of rotation wherein the position of a cutter holder is adjustably displaceable in a direction transverse to said axis of rotation by way of a wedge piece slidable in a direction transverse to said axis of rotation and to the direction of displacement of said cutter holder, said wedge piece having a first plane surface in sliding engagement with a corresponding wedge surface on said cutter holder adjustably displacing said cutter holder in an appropriate guiding and holding recess extending in said direction of displacement of the cutter holder, the improvement comprising said cutter holder having a circularly cylindrical body slidably disposed along its longitudinal axis in a generally circularly cylindrical recess of said cutting tool, a cutout portion in said cutter holder defining a second plane surface substantially parallel to the longitudinal axis of said cutter holder and to the sliding direction of said wedge piece, and a corresponding third plane surface on said wedge piece in sliding engagement with said second plane surface preventing rotation of said cutter holder about its longitudinal axis.

4,043,697

MOUNTINGS FOR BORING TOOL BITS

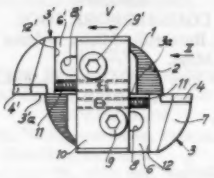
Otto Eckle, Loechgau, Germany, assignor to Komet Stahlhalter- und Werkzeugfabrik, Robert Breuning GmbH, Besigheim, Germany

Filed July 8, 1976, Ser. No. 703,430

Claims priority, application Germany, July 26, 1975, 7523920[U]

Int. Cl.² B23B *29/02*

U.S. Cl. 408—182 **12 Claims**



1. A mounting for a pair of boring tool cutting bits, the mounting being such that the two cutting bits, when present, project beyond a forward end of a mounting member and are displaced through 180° relative to each other, each being mounted on a respective cutting bit carrier which is radially adjustable relative to and guided on a toothing on the mounting member, the said toothing extending in the direction of adjustment at right angles to the rotary axis of the mounting member and having parallel teeth, by means of a similar toothing and which can be fixed relative to the mounting member by means of a clamping screw passing through an oblong hole in the cutting bit carrier and engaging with the mounting member, there also being provided for the radial adjustment of the cutting bit carrier, in each case, an adjusting screw engaging with the carrier and extending in the direction of the toothing, and wherein the toothing for the two cutting bit carriers is provided on the forward face of the mounting member in a common radial plane with continuous teeth running across the whole breadth of the forward face, and the cutting bit carriers have a similar toothing on their rear ends facing towards the said forward face, and that the clamping screws are arranged parallel to the said rotary axis.

4,043,698

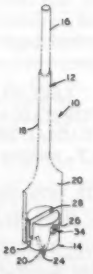
DRILL ATTACHMENT

Rodney Chelberg, 11721 Excelsior Blvd., Hopkins, Minn. 55343

Filed Nov. 2, 1976, Ser. No. 738,244

Int. Cl.² B23B *51/00*

U.S. Cl. 408—201 **3 Claims**



1. A boring follower for a standard flat drill bit of the type having a shank mountable in a drill brace, a bit stem issuing therefrom and having a substantially flat paddle blade connected thereto including an axially extending tapered cutting nose, said boring follower comprising a cylindrical section

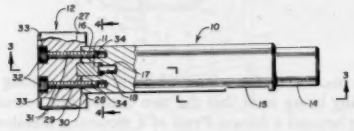
having an axially extending diametral slot therein, said paddle blade of said bit being matingly engageable in said diametral slot, said diametral slot terminating in a radially extending well-bottom in said follower, an axially extending tapered socket in said well-bottom said tapered socket extending through said follower, said socket having a taper corresponding to said taper of said nose of said paddle blade, said nose of said paddle blade being registrable in said tapered socket, and means releasably fixing said follower on said paddle blade.

4,043,699

COUNTERBORE TOOL

John M. Farrand, Burnsville, Minn., assignor to Design Mold Inc., Lakeville, Minn.

Filed June 9, 1976, Ser. No. 694,136
Int. Cl.² B23B *51/00*
U.S. Cl. 408—201 **7 Claims**



1. A counterbore tool comprising:

a shank to be mounted in a machine tool for rotation thereof, said shank having an open slot of uniform depth extending inwardly from the outer extremity of said shank,

a cutting tool having a body portion and an outer cutting portion, said body portion being disposed in said slot in engagement with the bottom of said slot completely across said shank portion, said body portion having a depth substantially equal to the width of the slot so as to prevent any relative lateral movement of said tool with respect to said shank and having a width greater than the depth of said slot so as to project beyond the open end of the slot,

said cutting tool and said shank having interfitting male and female portions to prevent any movement of said tool longitudinally thereof and transversely of said shank,

a pilot member disposed in telescoping engagement with and over the end of said shank in which said cutting tool is disposed and engaging said cutting tool and having a diameter greater than that of the shank but less than the length of said cutting tool, said pilot member having an open slot of substantially the same width as the depth of said cutting tool and into which said cutting tool extends,

and clamping means for holding said pilot member on said shank member and clamping said cutting tool therebetween in the open slots of said shank and said pilot member to prevent any movement of said cutting tool longitudinally of said shank, said cutting portion of said cutting tool extending radially a predetermined distance beyond the outer wall of said pilot member.

4,043,700

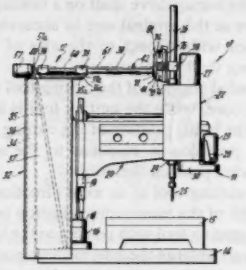
X—Y CONTROL FOR RADIAL ARM AND THE HEADSTOCK OF A RADIAL DRILLING MACHINE

Arrigo Singer, Bronx, N.Y., assignor to Toolmatic Corporation, Carlstadt, N.J.

Filed Nov. 15, 1976, Ser. No. 741,781
Int. Cl.² B23B *39/12, 39/04*
U.S. Cl. 408—237 **21 Claims**

15. In combination, a radial arm drilling machine comprising a base, a column rotatably mounted on said base, a radial arm mounted on said column and rotatable therewith, a drill headstock slidable back and forth on said radial arm, a drill spindle rotatably and slidably mounted on said headstock and disposed parallel to the axis of rotation of said column, and control means for moving the axis of the spindle of said headstock only along X—Y axes to bring the spindle from one drill position to another and thereby rotate said arm from the angular position of said arm in said one drilling position to the angular position of said arm in said another drilling position and to cause said headstock to slide on said arm during movement of said axis of said spindle only along said X—Y axes.

17. In combination, a machine comprising an arm pivoted about a fixed axis of rotation, a cutting tool carrier slidable on said arm, a cutting tool mounted on said carrier on an axis



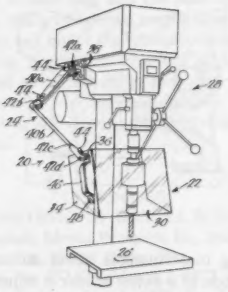
parallel to said fixed axis, and control means to move the axis of said tool from one axial and radial predetermined position relative to the axis of rotation of the arm, to another axial and radial predetermined position relative to said axis, said control means comprising means to move said axis of said tool only along X—X and Y—Y axes, to thereby slidably move said carrier along said arm and to simultaneously rotate said arm about its axis of rotation.

4,043,701

SAFETY SHIELD ASSEMBLY

Ben E. Jaeger, Rte. 2, Box 49, Plano, Ill. 60545

Filed May 19, 1976, Ser. No. 687,930
Int. Cl.² B23B *47/00*
U.S. Cl. 408—241 G **6 Claims**



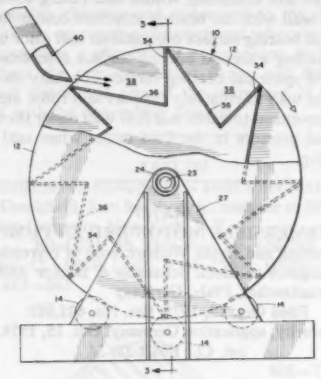
1. In a safety shield assembly for abrading of cutting tools and the like, a unitary, generally U-shaped transparent shield having a generally planar center portion and a pair of generally planar side leg portions extended out of the plane of said center portion; an arm having a plurality of movable joints, said arm being secured at one of its ends to one of said pair of side leg portions and being mountable at an opposite end to said machine remote from a work area thereof, said arm being movable to support said shield at a position in front of said work area with said center portion between said work area and an operator station and with said side leg portions extending away from said operator station toward opposite sides of said work area, and to support said shield at positions remote from said work area; and a handle fastened to said shield, grippable by an operator of said machine to move said shield on said arm to said positions.

4,043,702

WATER WHEEL ASSEMBLY

Lui Gotti, P.O. Box 333, El Centro, Calif. 92243

Filed Apr. 16, 1975, Ser. No. 568,611
Int. Cl.[2] F03B 7/00
U.S. Cl. 415—202 1 Claim



1. A water wheel assembly comprising:
a. a water wheel having
i. a pair of spaced parallel circular side walls;
ii. a plurality of radially extended paddles mounted to and between peripheral portions of said side walls, each of said paddles having a radially inner edge and a panel mounted to and between said side walls and extending from the radially inner edge of the respective paddle substantially normally thereto and extending substantially to the circumference of said side walls;
b. means of supporting said water wheel for rotation on a horizontal axis comprising a plurality of flanged railroad car wheels rotationally mounted beneath and in supporting contact with said side walls and having flanges thereof mutually oppositely disposed to laterally secure said water wheel, said wheels each being non-translatory and having an axis parallel to the axis of said water wheel and the axes of said side walls;
c. a generally straight conduit extending upwardly to an elevated water supply and being open at the lower end, the lower end of said conduit being directed generally across the upper portion of said water wheel normal to the axis thereof such that water gushing from said conduit is directed generally toward consecutive ones of said paddles as said water wheel rotates;
d. said water wheel having an axle, and including mechanical linkage means coupling said axle to a power take-off shaft.

4,043,703

IMPACT RESISTANT COMPOSITE ARTICLE COMPRISING LAMINATED LAYERS OF COLLIMATED FILAMENTS IN A MATRIX WHEREIN LAYER-LAYER BOND STRENGTH IS GREATER THAN COLLIMATED FILAMENT-MATRIX BOND STRENGTH

Robert G. Carlson, Greenhills, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 22, 1975, Ser. No. 643,496
Int. Cl.[2] B23P 15/04; B32B 7/04, 31/20; F01D 5/14
U.S. Cl. 416—230 9 Claims

1. A composite article comprising a plurality of bonded filament laminates, said laminates including a plurality of collimated filaments sandwiched between and bonded to two metallic foil layers comprising a matrix, wherein the degree of bonding between adjacent laminates is greater than the degree of bonding between the filaments and the matrix, and wherein the ultimate shear stress of the matrix occurs at a strain less than the ultimate shear strain of said filaments.

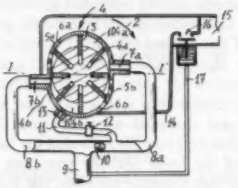
6. A blade for use in a fluid flow machine comprising a plurality of substantially parallel, bonded filament laminates, said laminates including a plurality of collimated filaments sandwiched between and bonded to two metallic foil layers comprising an aluminum-base matrix, wherein the degree of bonding between adjacent laminates is greater than the degree of bonding between the filaments and the matrix, and wherein the ultimate shear stress of the matrix occurs at a strain less than the ultimate shear strain of said filaments.

4,043,704

DOUBLE-ACTING ROTARY EXPANSIBLE CHAMBER PUMP ADAPTABLE TO SERIES OR PARALLEL OPERATION

Bernard Zimmern, Neuilly-sur-Seine, France, assignor to Uniscrew Limited, Hamilton, Bermuda

Filed July 15, 1975, Ser. No. 596,060
Claims priority, application France, Aug. 5, 1974, 74.27132
Int. Cl.[2] F04B 23/04
U.S. Cl. 417—62 8 Claims



6. A regulated double acting rotary compressor comprising two compression spaces each constituted by at least one compression chamber provided with moving partition walls in cooperating relation with a casing, each of said spaces being respectively provided with at least one inlet orifice and a discharge orifice, wherein said casing is provided in the portion corresponding to one of said spaces with an additional orifice connected by a pipe to the discharge orifice of the other space, said pipe being provided with a shutoff valve, the dimension of said additional orifice being substantially inscribed within the contact area between said casing and one of the moving partition-walls aforesaid, and the position of said additional orifice being such that a compression chamber does not communicate simultaneously with said additional orifice and with any inlet orifice in any position of said moving partition-walls, thereby permitting the output flow of the first space to be added to the flow of the second space by operating said shutoff valve.

4,043,705

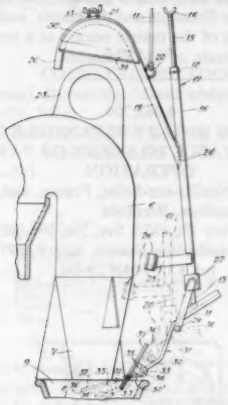
REACTOR JET PUMP PLUGS

Vernon I. Schlosser, 1009 N. 11th St., Clinton, Iowa 52732

Filed Nov. 24, 1975, Ser. No. 634,426
Int. Cl.[2] F04F 5/00
U.S. Cl. 417—151 10 Claims

1. A tool of the class described for shutting off a boiling water reactor circulating jet pump which has a flat upwardly extending lug, comprising a vertically disposed tubular frame member (16) having a threaded longitudinal bore, an included longitudinally extending threaded actuating rod (15) threaded through said frame member and being rotatable on said threads to extend or retract the lower end of said rod (15), a diagonally upwardly and laterally extending hook shaped suspension arm member (19) fixedly attached at its lower end to the upper part of the frame member (16) and having a downwardly open hooked portion (19) at its upper end, side bars on said hooked portion (19) adapted to embrace the flat upwardly extending lug (23) of a jet nozzle member 6, a laterally projecting spacing

bracket (25) on the side of the tubular frame in alignment with the aforesaid hook shaped suspension portion, said threaded rod (15) having a manipulating eye at its upper end, laterally and downwardly extending diagonal bracket arms (28) fixed on opposite sides of the lower end of the frame member (16), a swinging closure lever (31) hinged intermediate its ends on and between the lower ends of said bracket arms (28), said hinged



closure member comprising a lever 31, one arm of which is engageable by said threaded actuating rod (15) and an upwardly facing closure pad (37) swiveled on the upper side of the other arm of the lever (31) for engaging a downwardly directed open jet pump nozzle member, the upper end portion of which member is adapted to be engaged by said hooked portion (20) of the suspension arm (19).

4,043,706

BEARING SUPPORT STRUCTURE FOR ELECTRO-MAGNET DRIVEN PUMP

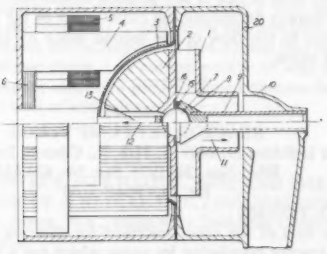
Alan John Walker, 3 Argyle Street, Dornoch, Sutherland, Scotland

Continuation of Ser. No. 476,293, June 4, 1974, abandoned. This application Apr. 30, 1976, Ser. No. 681,811

Claims priority, application United Kingdom, June 5, 1973, 26630/73

Int. Cl.[2] F04B *17/00, 35/04*

U.S. Cl. 417—353 **3 Claims**



3. An electromagnetically driven pump comprising:

a pump casing having first and second axially spaced end walls where said second wall comprises a substantially magnetically permeable material;

a fluid inlet coaxially positioned within said first wall;

a fluid outlet in said casing;

a rotor unit in said casing comprising a motor armature integral with a pump impeller and where said unit has a portion opposite said first wall and a portion opposite said second wall with substantially all of the portion opposite said second wall being under the influence of liquid pressure in the fluid outlet when said pump is operating;

a magnetic system exterior of said casing adjacent said second wall for providing a rotating magnetic force to rotate said rotor unit; and

a bearing structure coaxially mounted with respect to said first wall and extending within said casing towards said second wall with the bearing structure comprising a first spherical bearing surface mounted on said rotor unit and a pillar having a second bearing surface complimentary to said first spherical bearing surface coaxially mounted to said first wall to rotatably support said rotor unit against axial movement towards said first wall under the influence of liquid pressure in the fluid outlet when said pump is operating.

4,043,707

SUBMERSIBLE MOTOR-DRIVEN PUMP

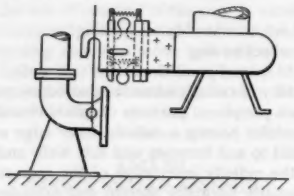
Anton Heumann, and Heinz Weibart, both of Nuremberg, Germany, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Pfalz, Germany

Filed Oct. 14, 1975, Ser. No. 621,981

Claims priority, application Germany, Oct. 15, 1974, 2448540

Int. Cl.[2] F04B *39/14*

U.S. Cl. 417—360 **7 Claims**



1. An underwater pumping arrangement of the type including a submersible pump having a pump outlet conduit provided with a first connecting flange adapted to register with a second connecting flange of an outflow conduit permanently provided at the bottom of a liquid-filled pit or container so as to form with the second connecting flange a seal-tight conduit joint, and being of the type in which the pump as it is lowered into the liquid-filled pit or container towards the bottom thereof is guided by guiding means into a predetermined position in which the first connecting flange registers with the second connecting flange, the arrangement including supporting means at the underside of the pump for directly supporting the pump upon the bottom of the pit or container when the pump has been lowered into the predetermined position, and one of the conduits being provided with an expandable-contractable connecting chamber connected to one connecting flange and activatable for pressing the one connecting flange into seal-tight engagement with the other connecting flange to form the seal- tight conduit joint, whereby by virtue of the provision of the expandable-contractable connecting chamber and the supporting means there is established between the first and second connecting flanges a seal-tight engagement whose effectiveness is not mainly dependent upon the inherent weight of the pump itself, wherein the expandable-contractable connecting chamber assumes a certain installed-condition length when the connecting chamber is activated and maintains the connecting flanges pressed together, and further including biasing means operative for urging the connecting chamber and the one connecting flange connected thereto in direction towards the other connecting flange and operative when the pump is not yet in the predetermined position for urging the expandable-contractable connecting chamber into a position in which its length exceeds the installed-condition length by a predetermined distance, and further wherein the lower peripheral portion of the first connecting flange and the upper peripheral portion of the second connecting flange are complementarily

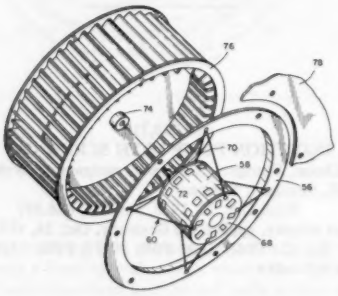
chamfered so that upon lowering of the pump into the predetermined position the chamfered portions engage each other causing the one connecting flange to be pushed back against the force of the biasing means by the other connecting flange, wherein the expandable-contractable connecting chamber is connected at one end of the connecting flange, and further including an additional flange connected to the other end of the connecting chamber and connected to the conduit provided with the connecting chamber, and where-in said biasing means comprises a plurality of compression springs located intermediate the one connecting flange and the additional flange and distributed around the periphery of the conduit provided with the connecting chamber.

4,043,708

RESILIENT MOUNTING FOR FAN MOTOR

John B. Greenfield, Fort Smith, Ark., assignor to Rheem Manufacturing Company, New York, N.Y.

Filed Feb. 10, 1976, Ser. No. 656,783
Int. Cl.[2] F04B *17/00*; F16F *15/00*; H02K *5/24*
U.S. Cl. 417—363 **9 Claims**



1. An improved motor mount assembly for fan motors of the type having a housing with a generally cylindrical configuration, opposed end plates and a drive shaft extending outwardly from one end plate along the axi- of rotation of the cylindrical housing, said assembly comprising, in combination:

a spaced, separate, generally circular bracket surrounding said motor housing, and forming a plane generally perpendicular to the axis of rotation generally intermediate the end plates;

a plurality of flexible cables for attaching the motor housing to the bracket, each cable having one end connected to the outer edge of one end plate and having the opposite end attached to the bracket, said cables being generally spaced in a radial direction outward from the center of the motor about the circumference of each motor end plate, and all connected to the bracket in the plane of the bracket to support the motor and prevent noise and vibration transmission from the motor, suspension and support of said motor being such that some rotational movement of the motor is permitted and rotational motor vibration transmission to the bracket is minimized.

4,043,709

ADJUSTABLE STOP ASSEMBLY

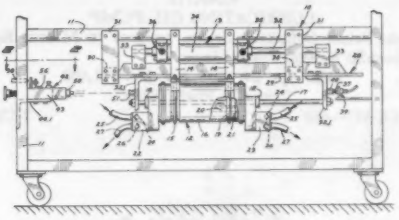
John J. Grevich, Star Prairie, Wis., assignor to Domain Industries, Inc., New Richmond, Wis.

Filed Aug. 21, 1975, Ser. No. 606,651
Int. Cl.[2] F04B *17/00, 35/00*
U.S. Cl. 417—404 **7 Claims**

1. A stop apparatus to provide an extension between the frame and slide of a reciprocating liquid product-measuring pump for operating the air control valve of the reciprocating air motor to actuate the pump, comprising:

an elongate mounting extending in the direction of movement of the slide and having a longitudinally extending recesss defining a seat;

an elongate adjustable stop snugly but removably fitted in said seat and having oppositely facing abutment surfaces adjacent its opposite ends, the abutment surfaces being interposed between the air valve and portions of the frame and slide to operate the valve at a predetermined slide position, the stop including an adjustment rod threadedly



mounted on the stop, one end of the rod comprising one of said abutment surfaces, the other end of the rod having a socket fitting, the end of the stop adjacent said socket fitting comprising the other of said abutment surfaces, an insert fitting slidable on the mounting and aligned with the rod for detachable telescopic union with the socket fitting for revolving the rod along the threads; and

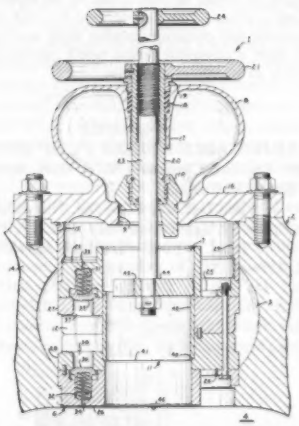
readily releasable means retaining the adjustable stop on the mounting.

4,043,710

COMPRESSOR UNLOADER ASSEMBLY

Stuart E. Bunn, and Herbert B. Owsley, both of P. O. Box 388, Shawnee Mission, Kans. 66201

Filed Aug. 9, 1976, Ser. No. 712,927
Int. Cl.[2] F04B *23/00*
U.S. Cl. 417—440 **13 Claims**



1. An unloader assembly for use in a gas compressor having a compressor cylinder and a compressor piston slideable therein, said unloader assembly comprising:

a. a suction valve communicating a compressor suction chamber and a compressor cylinder, said suction valve having an interior surface defining a central passage therethrough and a plurality of circumferentially spaced ports communicating the suction chamber and the suction valve central passage, said suction valve being adapted to permit one-way gas flow from said compressor suction chamber to said compressor cylinder with at least a portion of the flow being through said suction valve central passage;

b. an unloader piston slideable in said suction valve central passage between a first position closing said suction valve ports and a second position opening said suction valve ports; and

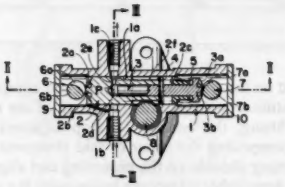
c. means operatively connected to said unloader piston for selectively moving said piston between the first position and the second position.

4,043,711

LUBRICATING OIL PUMP

Tadashi Seino, Chigasaki, Japan, assignor to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1975, Ser. No. 571,400
Int. Cl.[2] F04B *19/02*
U.S. Cl. 417—469 **2 Claims**



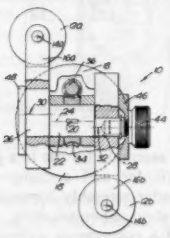
1. A lubricating oil pump comprising: a pump body having a cylinder chamber, suction port and at least one delivery port; a pair of plungers fitted rotatably and slidably in said cylinder chamber, having ridge-shaped cams formed along peripheral edge of respective outer end surfaces and connected with each other so as to be integrally rotatable in a rotating direction but relatively movable in a thrust direction; a pair of guiding column members positioned perpendicular to said pair of plungers and engaged respectively with said cams so that, when said pair of plungers are rotated, they may be respectively reciprocated in the thrust direction; a spring applied between said pair of plungers in order to bias them to be separated from each other; and a pump chamber defined by said pair of plungers therebetween and communicatable with said suction port and delivery port, a pumping action being carried out when either of said pair of plungers is driven.

4,043,712

ADJUSTABLE ROLLER PUMP ASSEMBLY

Graziano Azzolini, Cavezzo - MO., Italy, assignor to Sandoz Ltd., Basel, Switzerland

Filed Dec. 23, 1975, Ser. No. 643,678
Claims priority, application Italy, Dec. 17, 1975, 28990/75
Int. Cl.[2] F04B *43/08, 43/12, 45/06*
U.S. Cl. 417—477 **2 Claims**



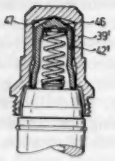
1. An adjustable roller pump assembly, comprising a pair of cylindrical rollers, a pair of arms at the end of which one of the pair of cylindrical rollers is rotatably mounted for rotation about their axis, a body rotatable about an axis in which the pair of arms are slideably mounted, the axes of the cylindrical rollers being parallel to and diametrically spaced away from the axis about which the body is rotatable so that sliding of the arms in the rotatable body adjusts the distance between the axes of the rollers, an adjustment shaft rotatably mounted in the body with its axis of rotation transverse to the axis about which the body is rotatable and carrying at each end a cylindrical locating element rotatable with rotation of the adjustment shaft, the axis of the cylindrical locating element at one end of the adjustment shaft being eccentric to one side of the adjustment shaft axis of rotation, and the axis of the cylindrical locating element at the other end of the shaft being equally eccentric to the other side of the adjustment shaft axis of rotation, the arms on which the rollers are mounted each being provided with a flattened cylindrical opening into which the cylindrical locating elements fit rotatably so that the axes of the rollers are equidistant from the axis of rotation of the body; whereby rotation of the adjustment shaft and locating elements causes displacement of the arms and corresponding displacement of the rollers.

4,043,713

FUEL INJECTION PUMP WITH SCREW CAP INSERT

Franz Eheim, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 21, 1975, Ser. No. 624,397
Claims priority, application Germany, Oct. 24, 1974, 2450521
Int. Cl.[2] F04B *7/04;* F04b *39/10;* F16K *15/00*
U.S. Cl. 417—499 **1 Claim**



1. In a fuel injection pump for an internal combustion engine, said pump including a housing with a cylinder bore, a cylinder bushing within said bore, and a reciprocating and rotating pump piston moving within said cylinder bushing, and further includes a valve sleeve disposed coaxially with said cylinder bushing and containing a spring-loaded valve, a screw cap threadedly engaging said housing and serving as a fuel chamber and for compressing said valve sleeve against said cylinder bushing and against said housing; the improvement comprising:

a substantially cup-shaped elastic insert located coaxially within said screw cap and serving to transmit axial forces from said screw cap to said valve sleeve, said cylinder bushing and said housing and contained within said insert said spring, wherein:

i. said elastic insert has a closed end, remote from said valve sleeve, said closed end being at least partially conical; and

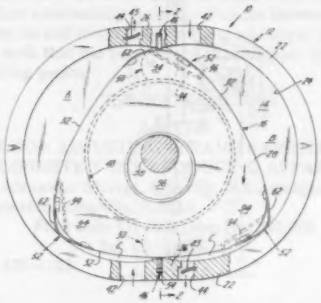
ii. said screw cap has an interior end region which is at least partially conical, for engagement with said conical end of said elastic insert, the slope of the conical surface of said screw cap being smaller than the slope of the conical end of said elastic insert.

4,043,714

SEAL GRID ASSEMBLY FOR ROTARY PISTON MECHANISM

Murray Berkowitz, Woodcliff Lake, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed May 24, 1976, Ser. No. 689,184
Int. Cl.[2] F01C 19/06, 19/04; F04C 27/00
U.S. Cl. 418—123 13 Claims



1. An improved seal grid assembly for rotary piston mechanisms, having a housing with axially spaced end walls and a peripheral wall interconnecting the end walls to form a multi-lobed cavity therebetween and having a rotor mounted within said cavity for rotation on an axis eccentric to the housing cavity axis, the rotor having opposite end faces adjacent the housing end walls and a plurality of flank surfaces converging with each other to form a plurality of circumferentially spaced apex portions so that the rotor defines with the housing walls a plurality of working chambers which vary in volumetric size and gaseous fluid pressure as the rotor rotates within the housing cavity, the improved seal grid assembly comprises, in combination with a seal blade means at each of the junctures of the housing cavity lobes;

a. a flexible plate seal carried in each of the apex portions of the rotor;

b. each of said flexible plate seals includes a sealing surface movable between a retracted position where it is out of engagement with the peripheral wall and an extended position where it is in engagement with the peripheral wall;

c. each of said flexible plate seals and its associated apex portion of the rotor defining a space therebetween;

d. a mechanical biasing means acting on the flexible plate seal to exert a force on the latter in a direction to urge the sealing surface in a retracted position; and

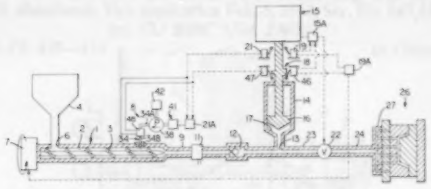
e. passage means in said rotor for each of said flexible plate seals communicating the associated space with the working chambers to conduct gaseous fluid to and from the working chambers and thereby allow movement of an associated flexible plate seal to the retracted position under the urging of the biasing means just prior to engagement with a non-rotating seal element at each of the lobe junctures and to effect movement to the extended position for re-engagement with the peripheral wall after such engagement with each of said non-rotating seal elements at the lobe junctures.

4,043,715

PUMPED INJECTION OF GAS FOR MAKING FOAMED PLASTIC

James W. Hendry, Holland, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed June 2, 1975, Ser. No. 582,631
Int. Cl.[2] B29D 27/00
U.S. Cl. 425—4 R 12 Claims



1. An apparatus for creating a foamed plastics material, the combination comprising:

a passageway comprising a wall bounding a chamber and plasticating means associated therewith for plasticating a plastics material while simultaneously causing same to travel through said passageway;

a source of gas inert to said plastics material having at least one gas outlet;

conduit means connected to said passageway through said at least one gas outlet for routing said gas to said passageway, said conduit means projecting beyond said wall into said chamber with said gas outlet offset from said wall into the path of plasticated material through said chamber;

a check valve in said conduit means and oriented to permit the passage of said gas to said passageway but prevent the passage of plasticated plastics material in the reverse direction;

means operatively associated with said conduit means for supplying a train of discrete gas pulses from said source through said conduit means to said passageway at a gas pulse pressure sufficiently exceeding the instantaneous plastics material pressure as to inject a discrete quantity of gas into said material travelling past said gas outlet, and at a gas pressure between pulses sufficiently lower as to stop gas entry into said material, said supplying means comprising an intermittent output, positive displacement pump and means operatively associated with said pump for repetitively cycling said pump at a gas pulse frequency which is high compared to the rate at which the passageway is refilled with fresh plastics material and synchronized with the desired rate of gas bubble ejection at said gas outlet, the gas bubble ejection rate being a function of the pulse frequency and number of gas outlets from said conduit means, and the quantity of gas per bubble is closely controllable, the volumetric capacity of the portion of said conduit means between said check valve and said passageway being less than the volumetric capacity of said pump.

4,043,716

APPARATUS FOR PROVIDING A STREAM OF MOLTEN METAL FROM A METALLIC INGOT

William Daniel Lafferty; James Thomas Smith, and Nicholas Wayne Rench, all of Towanda, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

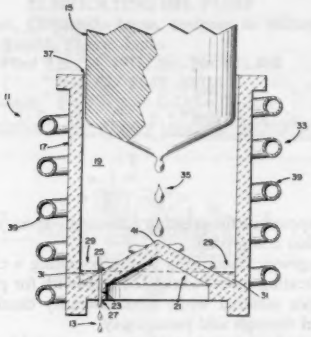
Filed Dec. 4, 1975, Ser. No. 637,761
Int. Cl.[2] B22D 23/08
U.S. Cl. 425—6 11 Claims

1. An apparatus for providing a stream of molten metal from a metallic ingot heated to melting within said apparatus, said apparatus comprising:

a substantially upright crucible member defining a chamber therein for receiving said metallic ingot and including a

lower base portion having at least one orifice therein, said orifice including a first open end having access to said chamber and an opposing second open end having access to the environment below said crucible member;

means within said crucible member for maintaining a quantity of molten metal from said metallic ingot at an established level within said chamber substantially below said first open end of said orifice; and



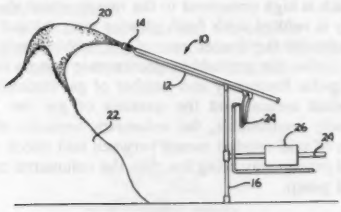
heating means positioned externally of said crucible member for heating said metallic ingot to a predetermined temperature sufficient to melt said ingot at a pre-established rate and for heating said quantity of molten metal within said maintaining means to an establishd temperature greater than said predetermined temperature of said ingot to facilitate passage of said molten metal through said orifice when said molten metal within said maintaining means exceeds said established level within said chamber.

4,043,717

SULPHUR GRANULATOR

Marcos D. Riano, Bakersfield, Calif., assignor to Valley Nitrogen Producers, Inc., Helm, Calif.

Filed Apr. 12, 1976, Ser. No. 675,905
Int. Cl.[2] B29C *23/00*
U.S. Cl. 425—7 **9 Claims**



1. A sulphur granulator for preparing granular sulphur from a stream of molten sulphur comprising:

a. a sulphur conduit having a uniquely designed spray head coupled at one end thereof, said spray head having a nozzle opening with a continuous cross-section configured orifice to discharge said sulphur in a deluge spray and a means for agitating said molten sulphur, said means for agitating disposed in said spray head adjacent said nozzle opening; and

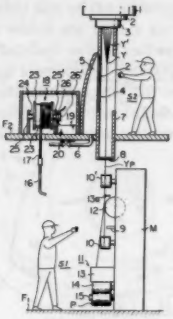
b. a water jacket circumferentially disposed about said sulphur conduit adjacent said spray head so as to form an annular orifice, said annular orifice terminating behind said nozzle opening.

4,043,718

SPINNING APPARATUS WITH RETRACTABLE SUCTION GUN

Yoshisuke Takenaka, and Kikuo Hori, both of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Sept. 30, 1975, Ser. No. 618,007
Claims priority, application Japan, Oct. 3, 1974, 49-113290; Oct. 3, 1974, 49-113291
Int. Cl.[2] D01D *7/00*
U.S. Cl. 425—72 S **7 Claims**



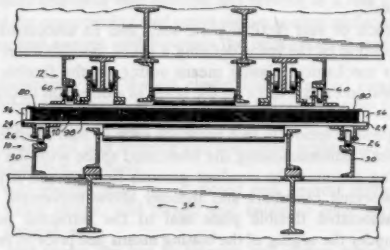
1. In a spinning apparatus for producing synthetic threads provided with at least one spinning unit including a spinneret for extruding a filamentary stream, a spinning duct below the spinneret for receiving said filamentary stream, a cooling chamber formed into said spinning duct for cooling and solidifying said filamentary stream into a thread, a take-up device mounted on a base floor below said spinning duct, a first work space for threading said thread onto the take-up device being provided on the base floor in front of said take-up device, and a hand-held aspirating type of suction gun disposed in said first work space for taking up the free end of said thread, an improvement comprising means located adjacent to the first work space for retractably retaining a conduit for supplying compressed air into said suction gun and a closely adjacent conduit for carrying exhaust air and waste threads from said suction gun in such a condition that said conduits are capable of being freely pulled out therefrom.

4,043,719

APPARATUS FOR PRODUCING RIGID FOAM PLASTIC LAMINATED BOARD

William R. Jones, St. Petersburg, Fla., assignor to The Celotex Corporation, Tampa, Fla.

Filed Jan. 2, 1976, Ser. No. 646,334
Int. Cl.[2] B29D *27/04*
U.S. Cl. 425—115 **4 Claims**



1. In an apparatus for making a foam plastic laminated board having a foam plastic core encased between an upper and a lower sheet member and in which said apparatus has a lower conveyor comprising abutting platens forming a continuous

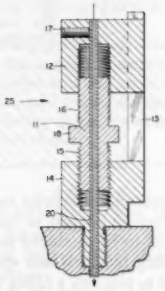
support surface in a horizontal plane, and an upper conveyor settably spaced from said lower conveyor, said conveyor having abutting platens forming a continuous limiting surface in a plane parallel to said horizontal plane of said lower conveyor and a pair of sheet unwind stations adjacent said conveyors adapted to provide said upper and said lower sheet members to said upper and lower conveyors, respectively, the improvement comprising having said platens of said upper conveyor shorter in a transverse direction than said platens of said lower conveyor, spaced limiting means attached along outer edges of each platen of said lower conveyor, said limiting means being located outwardly of the outer edges of said platens of said upper conveyor, said lower sheet having a width such that said lower sheet substantially spans the distance between said limiting means on said lower conveyor and said upper sheet having a width such that the outer edges of said upper sheet overlay said limiting means.

4,043,720

DEVICE FOR ADJUSTING STRAND CARRIER TUBE IN COMPOSITE YARN PRODUCING APPARATUS

Howard Alexander Mercer, Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed July 11, 1975, Ser. No. 595,000
Int. Cl.² B29F *3/10*
U.S. Cl. 425—113 **5 Claims**



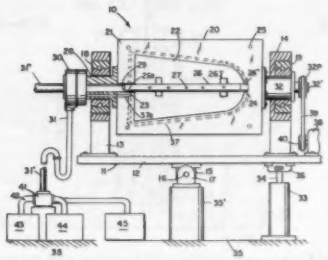
1. In an apparatus for forming a composite yarn comprising a carrier strand having an extruded polymer coating thereon, wherein the carrier strand is passed through a carrier tube positioned in a polymer extrusion die housing, said carrier tube functioning as a male die member to form an annular extrusion opening in the die housing, the improvement comprising: a support block attached to said die housing concentric with and surrounding a lower section of said carrier strand tube to thereby form a first channel, a portion of said first channel non-adjacent said die housing being spaced from said carrier tube and having a first pitch female screw thread; a longitudinally movable block concentric with, surrounding, and attached to an upper section of said carrier tube in spaced relationship to said support block; said movable block having a second channel concentric with and facing toward the first channel of said support block, a portion of said second channel being spaced from said carrier tube and having a second pitch female screw thread different from the first pitch screw thread facing axially toward the first pitch female screw thread of said support block and concentric with said carrier tube; means operatively associated with said movable block for preventing rotation of said movable block relative to said support block; and a longitudinal fitting concentric with and rotatable with respect to said carrier tube and interposed between said support block and said movable block, said longitudinal fitting having first and second pitch male screw threads mating respectively with the first and second pitch female screw threads so that rotation of the longitudinal fitting imparts relative movement between the movable block and the support block and between the carrier tube and the opening in the die housing as a function of the difference in pitch between the first and second screw threads.

4,043,721

COMPOSITE BODY MOLDING APPARATUS

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation of Ser. No. 300,248, Jan. 24, 1972, Pat. No. 3,875,273, which is a continuation of Ser. No. 744,048, July, 1968, abandoned. This application Feb. 6, 1975, Ser. No. 547,621
Int. Cl.² B29C *5/04, 27/00*
U.S. Cl. 425—116 **16 Claims**



1. A molding apparatus comprising:

a multiple-part mold defined by at least first and second mold members shaped to close together and to define a molding cavity therebetween in which cavity an article may be molded to shape,

first support means for rotatably supporting said multiple-part mold for rotation about a first axis,

means for varying the attitude of said first support means during the rotation of said mold thereon,

an elongated tubular member,

means for supporting said elongated tubular member fixed within said cavity of said multiple-part mold with said tubular member being detachably secured to said mold and extending from one wall of said mold,

supply means for a fluent molding material, said supply means being connected to said tubular member,

means for causing the flow of said fluent molding material to said tubular member from said supply means,

said tubular member having an opening therein to permit molding material to flow therefrom into said mold cavity, and

means for power rotating said mold about said first axis to distribute molding material about the surface of said mold cavity wall and the portion of said tubular member adjacent said wall of said mold to permit said molding material to solidify in situ on the wall of the mold and against said tubular member so as to form a composite molding defined by said hollow body with the tubular member integrally secured to the wall of said hollow body by the soldified molding material surrounding same near the mold wall and wherein both said hollow body and said tubular member are removeable from said mold.

4,043,722

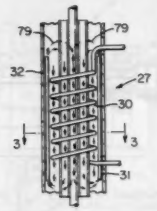
APPARATUS FOR HEAT CURING ELECTRICAL INSULATION PROVIDED ON A CENTRAL ELECTRICAL CONDUCTOR OF AN ELECTRICAL CABLE

John E. Baker, Wilmington, Del., and Charles C. Shackford, West Chester, Pa., assignors to Reynolds Metals Company, Richmond, Va.

Filed May 9, 1975, Ser. No. 575,943
Int. Cl.² B29C *25/00*
U.S. Cl. 425—174.8 R **12 Claims**

1. An apparatus for heat curing heat-curable electrical insulation provided on an electrical conductor of an electrical

cable by curing said insulation from its outer portion inwardly and substantially simultaneously therewith curing said insulation from its inner portion outwardly, said apparatus comprising, an outer housing made of a metallic material and adapted to contain steam under pressure, an electrical induction heating coil supported concentrically within said housing, said housing and coil being adapted to receive said conductor therethrough with its insulation thereon, said coil serving to heat said conductor within said housing which in turn transmits heat to said inner portion of said insulation to provide said heat curing thereof from said inner portion radially outwardly, a magnetic



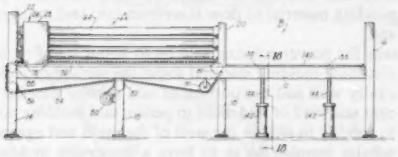
flux shield arranged within said housing and surrounding said induction coil, said shield providing a path of least resistance for lines for magnetic flux generated by said coil to thereby prevent said housing from being heated excessively during induction heating action provided by said induction heating coil, and means operatively connected to said housing for providing steam under pressure into said housing and against said insulation for providing said curing of said insulation from said outer portion inwardly, said substantially simultaneous curing of said insulation from its outer portion inwardly and from its inner portion outwardly being provided by said steam and said induction heating action respectively in said housing.

4,043,723

CONDUIT MOLDING MACHINE

Stewart E. Slaton, 2841 NE. 22nd Ave., Lighthouse Point, Pompano Beach, Fla. 33064

Filed Apr. 2, 1976, Ser. No. 672,998
Int. Cl.[2] B28B *7/18, 21/42*
U.S. Cl. 425—186 **10 Claims**



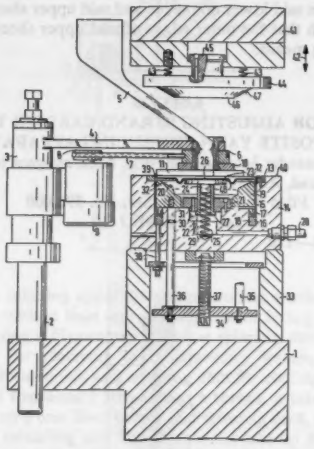
1. A conduit molding machine, comprising: an elongated supporting structure; a transversely extending bulkhead mounted on the upper part of the structure to form a mold receiving section and a mandrel operating section; said mandrel operating section including a travelling carriage having a plurality of mandrel driving sleeves disposed in parallel rows and in vertical tiers, said carriage including bearing means for rotatably supporting said sleeves; a mandrel disposed within each sleeve and mounted for rotative movement therein; a plurality of bearing sleeves carried by said bulkhead axially aligned with said sleeves in said carriage and adapted to receive said mandrels; a transversely extending plate fixed to said supporting structure adjacent said carriage, said plate including a plurality of openings therethrough aligned with said mandrels ian said carriage; means operatively associated with said carriage for reciprocating said carriage between said plate and said bulkhead whereby said mandrels traverse said mold receiving section; and means operatively associated with each mandrel for selectively connecting each mandrel to its surrounding driving sleeve or to an opening in said plate.

4,043,724

DEVICE FOR PRESSING ARTICLES SUCH AS PLATES FROM PULVERULENT PORCELAIN COMPOSITION

Rolf Egon Romnald Schubart, Kochel, Germany, assignor to Dorst-Keramikaschinen-Bau Otto Dorst U. Dipl. -Ing. Walter Schlegel, Kochel, Germany

Filed July 11, 1975, Ser. No. 595,235
Int. Cl.[2] B29C *3/00*
U.S. Cl. 425—218 **17 Claims**



1. A press for the pressing of articles such as plates with a rigid upper pressing punch shaped in accordance with the inner side of the article to be produced and with a space beneath the upper pressing punch which space is closed by an elastic membrane held in place by a filling web said membrane shaped on its edge in accordance with the peripheral shape and dimensions of the article to be produced, characterized in that the membrane is provided with an annular groove corresponding to the foot of the plate and has a height of filling amounting approximately to twice the foot height of the article to be produced and wherein the space closed by the membrane is filled with a pressure medium, and means for pressurizing the space closed by said membrane and filled with said pressure medium after the pressing punch is lowered to the pressing position and onto the pulverulent porcelain composition spread on the membrane within the limits given by the filling web.

4,043,725

APPARATUS FOR MOLDING PNEUMATIC VEHICULAR TIRES

Oskar Schmidt, Kittsee, Austria

Filed Sept. 30, 1976, Ser. No. 728,036
Claims priority, application Austria, Oct. 3, 1975, 7571/75
Int. Cl.[2] B29F *1/00;* **B29C** *6/00;* **B29H** *5/02, 5/08*
U.S. Cl. 425—542 **10 Claims**

1. An apparatus for molding a pneumatic tire with a body formed from a plurality of coaxial annular layers of elastomeric material, comprising:

a frame;

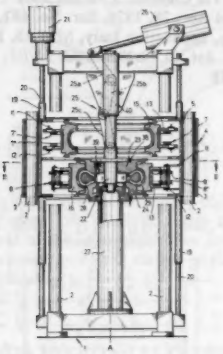
a generally toroidal core on said frame centered on an axis;

a plurality of sets of mutually complementary ring segments with inner radii larger than the core radius, said inner radii being different for the several sets;

a plurality of carriers on said frame supporting the ring segments of respective sets with freedom of radial dis-

placement, with reference to said axis, between an outwardly retracted position and a working position in which said segments complement one another to a continuous outer mold wall;

transport means coupled with said carriers for successively aligning the segments of sets with progressively larger inner radii with said core, the aligned segments in their



working position defining with said core an annular mold cavity;

closure means on said frame positionable to seal said mold cavity against the outside preparatorily to admission of elastomeric material into said mold cavity; and

actuating means on said frame coupled with said ring segments for displacing same between said retracted and working positions thereof.

4,043,726

HOT RUNNER TYPE MOLD

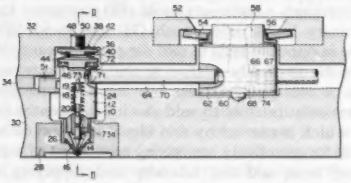
Shiro Tsunemoto, Edosaki; Teruki Mizuguchi, and Eiichi Hirayama, both of Azuma, all of Japan, assignors to Fuji Plastic Co. Ltd., Japan

Filed July 23, 1975, Ser. No. 598,200

Claims priority, application Japan, May 21, 1975, 50-60632

Int. Cl.[2] B29F *1/03*

U.S. Cl. 425—563 **12 Claims**



1. A hot runner mold which comprises a nozzle assembly having a nozzle body supported floatingly between a fixed head die plate and a cavity plate and bored with a horizontal hole, a heat insulating spring washer provided between the nozzle assembly and the cavity plate and serving to prevent heat transmission from the nozzle assembly to the cavity plate and to absorb thermal deformation of the nozzle assembly in its axial direction, a sprue bush provided with a horizontal hole aligned with the horizontal hole of the nozzle body, a buffer mechanism provided at the opposite end of said nozzle assembly from said heat insulating spring washer and serving to floatingly support the nozzle body and to absorb a repeated load during an injection operation in cooperation with said heat insulating spring washer, and a straight runner pipe made of material having good heat conductivity and slidably fitted in the horizontal holes, the runner pipe having its inside surface concavely curved at both end portions such that the end portions are progressively thinner toward the tips so as to cause the inner diameter of the tips to approximate the outer diameter thereof whereby the end portions expand in the radial direction into tight sealing engagement with the walls of the horizontal holes.

4,043,727

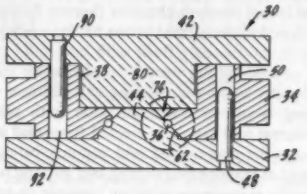
O-RING MOLD

Jerry Henzl, Crystal Lake, Ill., assignor to Crane Packing Company, Morton Grove, Ill.

Filed May 3, 1976, Ser. No. 682,743

Int. Cl.[2] B29F *1/00*

U.S. Cl. 425—578 **8 Claims**



1. A mold for forming ring seals free of flash at their internal and external diameters comprising:

a. a first plate having at least one frustrum extending from a surface thereof; said frustrum having a circumferential groove formed therein to generally define one-half of a mold cavity for a ring seal;

b. a second plate having a recess for receiving said frustrum, said second plate having a circumferential groove therein extending about said recess to generally define another half of a mold cavity;

c. said frustrum and recess having mating surfaces on one side of said cavity to seal said cavity, and spaced surfaces on the opposite side of said cavity to define a ring-shaped orifice; and

d. plunger means for injecting a seal composition through said orifice into said cavity.

4,043,728

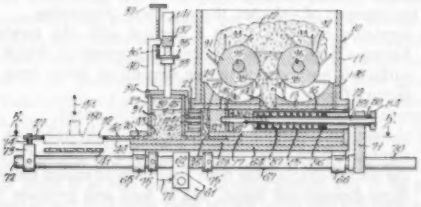
MOLDING APPARATUS

Harry H. Holly, Boca Raton, Fla., assignor to Hollymatic Corporation, Park Forest, Ill.

Continuation of Ser. No. 619,848, Oct. 6, 1975, abandoned. This application Nov. 1, 1976, Ser. No. 737,434

Int. Cl.[2] A22C *7/00*

U.S. Cl. 425—256 **5 Claims**



1. Apparatus for pressure molding a shaped article from a tissue containing food material subject to shrinkage during cooking, comprising: supply means for said material; a pressure chamber communicating with said supply means to receive material therefrom; a movable pressure applying means in the pressure chamber; a receiver chamber; means providing a supply passage for flow of material between said pressure

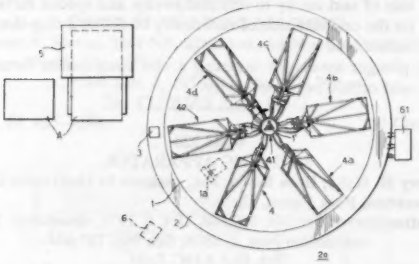
chamber and said receiver chamber communicating with said pressure chamber to receive pressurized material from said pressure chamber; means for moving said pressure applying means in said pressure chamber for exerting pressure on said material and thereby forcing the resulting said pressurized material into said receiver chamber; a movable mold plate having a cavity mold opening for registering with the said material in said receiver chamber; means for moving said mold opening into communication with said receiver chamber; means providing for flow of material from said receiver chamber to said mold opening; a piston in said receiver chamber; means for positioning said piston away from said mold plate to provide space for a preselected amount of said material between said piston and said mold plate opening; mold filling means for forcibly moving said piston to apply pressure to the said material in said receiver chamber thereby filling said mold opening with said material, said piston having a pressure applying end that is substantially flush with said mold plate at the completion of said filling; means for thereafter moving said mold and thereby said mold opening to a position where said mold opening is out of communication with said receiver chamber whereat said article is ejected from said mold opening; and means for maintaining said piston substantially flush with said mold at said opening during said moving of said mold opening thereby maintaining molding pressure on said material in said opening.

4,043,729

APPARATUS FOR SHAPING FLOOR COVERINGS FOR THE INTERIORS OF VEHICLES

Antonio Paracchi, Turin, Italy, assignor to Textilform S.A., Luxembourg

Filed Feb. 9, 1976, Ser. No. 656,110
Claims priority, application Italy, Feb. 17, 1975, 67400/75
Int. Cl.[2] B29C *17/00, 3/02*
U.S. Cl. 425—348 R **11 Claims**



1. On a factory floor, apparatus for shaping floor coverings for the interiors of vehicles, the apparatus comprising:

a turntable rotatable about a vertical axis, the turntable having a flat top surface for carrying operators, which top surface is not more than one step up or down from the factory floor;

means for rotating the turntable at a slow speed;

a plurality of operator-controlled presses mounted on the turntable, each press comprising a female die and a male die for hot-shaping the floor coverings to impart thereto a three-dimensional shape, and at least one pressure fluid actuator for closing the press;

supply pipes for supplying pressure fluid to the actuators of the presses; and

a rotary distributor on the axis of the turntable and connected to the pressure fluid supply pipes for the press actuators, for connecting the supply pipes to a stationary supply of pressure fluid;

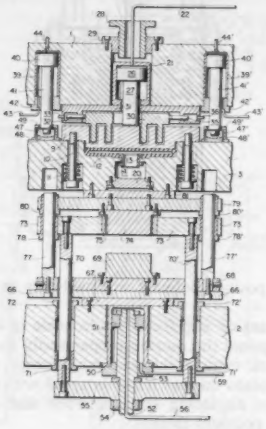
whereby unshaped floor coverings can be supplied to the turntable from one station, be shaped by the presses while the turntable rotates, and be removed from the turntable at another station.

4,043,730

HYDRAULIC PRESS FOR THE PRODUCTION OF TILES, DISHES, CUPS OF CERAMIC MATERIAL AND THE LIKE

Luigi Bettonica, Via Clusone, 3 Milan, Italy

Filed Apr. 28, 1976, Ser. No. 681,026
Claims priority, application Italy, May 13, 1975, 23241/75
Int. Cl.[2] B29B *5/02, 11/02*
U.S. Cl. 425—352 **4 Claims**



1. A press for the production of ceramic tiles and dishes, comprising in combination a pair of stationary top and bottom heads **(1** and **2),** columns **(4)** interconnecting said heads, a crosshead **(3)** mounted for vertical movement on said columns between said heads, a pressing plate **(9),** means **(10,11)** connecting said pressing plate to said crosshead **(3)** for limited vertical movement of said pressing plate relative to said crosshead, a bag of elastically flexible material between said pressing plate and said crosshead, means for supplying fluid under pressure to the interior of said bag, a die **(73)** having at least one die recess opening vertically therethrough, a movable punch **(74)** carried by said crosshead, a stationary mold **(69)** connected to one of said stationary heads, said punch **(74)** and mold **(69)** being receivable in opposite ends of said die recess, means **(50,51)** to move said die vertically relative to said stationary mold, hydraulic jack means **(40,41)** for moving said crosshead and punch vertically relative to said die independently from the pressure which is exerted by said elastically flexible bag, and means **(30)** for selectively restraining movement of said crosshead away from said die, whereby said supplying of fluid under pressure to said bag applies high pressure to said punch in the direction of said stationary mold.

4,043,731

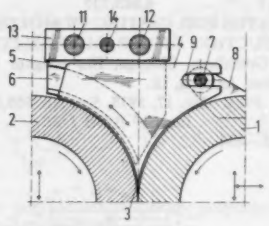
CALENDER WITH NIP BOUNDARY PLATES

Helmut Kratzmann, Altotting; Josef Heinik, Burgkirchen, Alz; Robert Obermaier, Burgkirchen, Alz; Erich Zentner, Burgkirchen, Alz, and Robert Redinger, Altotting, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 16, 1976, Ser. No. 742,138
Claims priority, application Germany, Nov. 20, 1975, 2552034
Int. Cl.[2] B29D *7/14*
U.S. Cl. 425—366 **1 Claim**

1. A calender with rollers forming nips in which the nip between a pair of rollers, of which one is obliquely adjustable, is bounded at the sides by plates adapted to the geometrical

shape of the nip region, comprising boundary plates provided with slots, a control beam parallel to the obliquely adjustable roller, which beam engages into said slots and the ends of which join to the bearings of the obliquely adjustable roller,



supporting plates on which the boundary plates are displaceably mounted by means of a guide device so that the plates on oblique adjustment of the adjustable roller are moved along a path which is concentric with the surface of the roller which is not obliquely adjustable.

4,043,732

PRESS FOR EXERTING FLAT PRESSURE

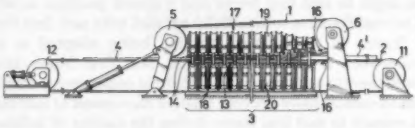
Karl-Heinz Ahrweiler, Krefeld, Germany, assignor to Eduard Kusters, Krefeld-Forstwald, Germany

Filed Dec. 22, 1975, Ser. No. 643,079

Claims priority, application Germany, Jan. 9, 1975, 2500706; Apr. 18, 1975, 2517204

Int. Cl.² B29C *15/00*; B29J *5/10*

U.S. Cl. 425—371 **9 Claims**



1. In continuous press which extends in the longitudinal direction including endless loops formed by longitudinally and transversely flexible conveyor belts which form opposed, substantially linear traveling spans moving in the longitudinal direction and defining a pressing zone, support structures applying pressure through said traveling spans to a strip of work carried therebetween and antifriction means in the form of multiplicity of endless loops of rotatively unpowered roller chains forming a bed of roller chain spans interposed between said support structures and said traveling spans, said roller chain spans extending in the longitudinal direction and being transversely packed together but each chain loop being individually free to travel independently with respect to the other loops of said multiplicity and said traveling spans, the improvement comprising said roller chains spans divided in the longitudinal direction of the press into a plurality of groups of closely following independent, endlessly circulating individual roller chain groups each having a plurality of transversely packed loops of roller chains individually free to travel independently.

4,043,733

ENDLESS BELT GUIDE ARRANGEMENT FOR A CONTINUOUSLY OPERATING PRESS

Albert De Mets, Roeselaare, Belgium, assignor to Bison-werke Bahre & Greten GmbH & Co. KG, Germany

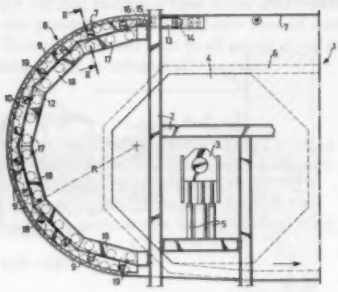
Filed June 29, 1976, Ser. No. 700,741

Claims priority, application Germany, July 2, 1975, 2529540

Int. Cl.² B29J *5/00*

U.S. Cl. 425—371 **22 Claims**

1. A guide arrangement for drivable endless belts associated with a manufacturing press which has an inlet zone and an outlet zone, the arrangement comprising: a plurality of guide roll means arranged on the press mutually parallel with respective axes thereof being arranged along a semicircle at at least one of the inlet zone and outlet zone of the press, means arranged on the press at at least one of the inlet zone and outlet



zone on respective sides of the endless belt for mounting said guide roll means, and means for selectively controlling displacement of at least one of said guide roll means mounting means along a semi-circular displacement path such that the endless belt is secured against lateral movement.

4,043,734

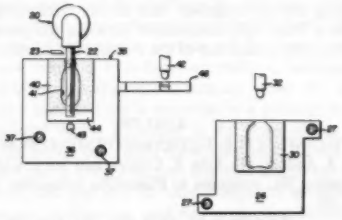
APPARATUS FOR BLOW MOLDING PLASTIC CONTAINER

Ambrose B. Dybala; Thomas J. Krall, and Albert R. Uhlig, all of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 490,713, July 22, 1974, Pat. No. 3,978,184. This application Mar. 15, 1976, Ser. No. 666,990

Int. Cl.² A01J *21/00*

U.S. Cl. 425—532 **9 Claims**



1. In a blow molding apparatus wherein a pre-form blow mold comprising a pair of mold sections shuttles between a parison-forming station and a pre-form blowing station, the pre-form blow mold sections being closed during movement to the pre-form blowing station and opened during return movement to the parison-forming station, and a final blow mold is permanently fixed at a final blowing station, the improvements of a clamping projection on each of said pre-form blow mold sections projecting toward said final blow station to be positioned at said pre-form blowing station when the pre-form blow mold is at said parison forming station and to be positioned at said final blow mold station when said pre-form blow mold is at said pre-form blowing station, said clamping projections being openable and closable with said pre-form blow mold sections and cooperably engaging therebetween a blown pre-form located at the pre-form blowing station when the pre-form blow mold sections are closed on a parison at the parison forming station and retaining the blown pre-form at the final blow molding station for blowing in said final blow mold as a parison is blown at the pre-form blowing station.

4,043,735

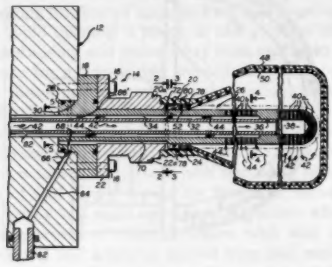
BALLOON BLOW MOLDING TOOLING

John J. Farrell, Green Brook, N.J., assignor to Farrell Patent Company, Green Brook, N.J.

Division of Ser. No. 419,510, Nov. 28, 1973, Pat. No. 3,955,908. This application Mar. 29, 1976, Ser. No. 671,054

Int. Cl.[2] B29C *17/07*

U.S. Cl. 425—389 2 Claims



1. A core rod for blow molding comprising a rod having first passage means and first orifice means communicating with said first passage means and with a mold chamber exterior of said rod and into which said core rod extends, and having second passage means and second orifice means communicating with said second passage means and with said chamber, means to provide blowing fluid under pressure into said chamber through said first passage means and first orifice means and said blowing fluid is removed from said chamber through said second orifice means and second passage means and wherein said first passage means comprises a tube coaxially disposed within said rod and said first orifice means is disposed at the end of the rod extending into said chamber, and said second passage means comprises an annular space between the exterior surface of said tube and the interior surface of the rod, and the second orifice means being spacedly disposed from said first orifice means and being spaced from the end of the rod extending into the chamber, and further comprising means to provide a fluid tight connection between the portion of said tube disposed at said end of the rod and the interior surface of the rod.

4,043,736

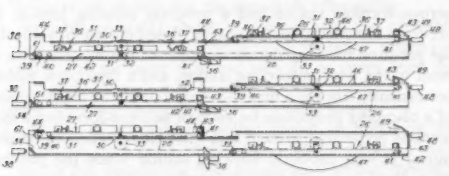
TWO-SHUTTLE THERMOFORMING MACHINE

Philip J. Andres, IV; John E. Crisler, and Sol I. Kalmich, all of Wheaton, Ill., assignors to Plastofilm Industries, Inc., Wheaton, Ill.

Filed Sept. 17, 1975, Ser. No. 614,339

Int. Cl.[2] B29C *3/04*

U.S. Cl. 425—397 8 Claims



1. A two-shuttle apparatus for a thermoforming machine which includes only two stations, a heating station, and a forming and loading station spaced generally horizontally from the heating station; said apparatus including a pair, only, of sheet-carrying shuttles having sheet-clamps thereon; means for moving the shuttles in endless tandem, with each shuttle passing through the entire of a vertically looped circuit to pass directly between and stop only at said stations repeatedly in an uninterrupted continuous sequence, while maintaining the shuttles right-side up, said means moving the shuttle moving toward the heating station above the shuttle moving from the heating station.

4,043,737

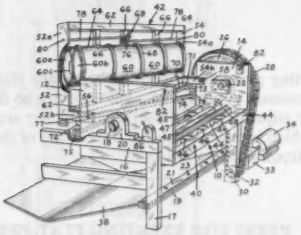
APPARATUS FOR CASTING IN MOLDS FOR THE PRODUCTION OF CERAMIC HOLLOWWARE

Jerome S. Greenberg, Chicago, Ill., assignor to Regal China Corporation, Antioch, Ill.

Filed Mar. 17, 1975, Ser. No. 559,038

Int. Cl.[2] B28B *1/28*

U.S. Cl. 425—434 7 Claims



1. Apparatus for use in casting ceramic holloware in molds comprising a substantially fixed support structure, an elongated carriage rotatably mounted in said support structure, said carriage comprising an elongated first frame and an elongated second frame, said second frame being pivotally mounted for movement with respect to said first frame to and from an open position in which said second frame is disposed at an angle to said first frame and a closed position in which said second frame is substantially parallel with said first frame, said frames in their closed position being adapted to hold therebetween a plurality of molds, said first frame having secured thereto a restraining member for engagement with said molds to substantially prevent relative movement of said molds with respect to said first frame during the casting of holloware and the rotation of said carriage, said restraining member comprising a metal bar extending substantially the length of said first frame, a portion of said bar extending inwardly from said first frame throughout substantially the length thereof and toward said second frame which portion engages notches in said molds, and a dual inflatable member on the inner side of said second frame which in the closed position thereof faces toward said first frame, said inflatable member including at least two cells pneumatically interconnected for substantially simultaneous inflation thereof whereby said carriage may hold molds of varying sizes simultaneously.

4,043,738

VIBRATORY COMPACTING MACHINE

Narciso G. Modesto, 585 Crest Court, Lake Forest, Ill. 60045, and Robert J. Brejcha, 10657 Preston St., Westchester, Ill. 60153

Filed Oct. 29, 1975, Ser. No. 626,708

Int. Cl.[2] B28B *1/08*

U.S. Cl. 425—456 4 Claims

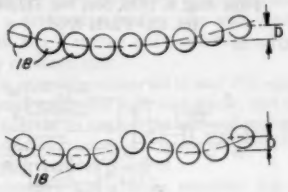
1. A machine for compacting and leveling a poured floor covering, comprising:

a generally horizontal frame having depending roller journal means on opposite sides thereof;

vibratory means securely connected to the frame; and

a plurality of elongated rollers rotatably mounted at their ends to said journal means and extending therebetween for contacting the floor covering and supporting the weight of the machine for movement thereover, said rollers being mounted on said journal means with their centerlines lying on a generally downwardly directed, convex line gener-

ally perpendicular to the centerlines of the rollers so that the centermost roller is lower than the two endmost rollers and the intermediate rollers are proportionately positioned therebetween.

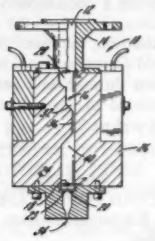


4,043,739

DISTRIBUTOR FOR THERMOPLASTIC EXTRUSION DIE

David W. Appel, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 21, 1975, Ser. No. 569,779
Int. Cl.[2] B29F *3/04*
U.S. Cl. 425—461 16 Claims



1. In an extrusion die for thermoplastic polymer,

an elongated orifice defining means,

an inlet for receiving molten polymer from an extruder, the axis of said inlet being normal to and intermediate the ends of said orifice defining means, and

distributor means defining a distributor cavity connected to and symmetrical laterally of the axis of the inlet and through which molten polymer flows axially from said inlet toward said orifice defining means,

said distributor cavity having axially connected sections including: (1) a distribution section having means defining channels for conveying polymer from the inlet laterally and in which the pressure loss and residence time of polymer flow varies across the full extent of said orifice defining means; (2) a pressure loss control section having, downstream of said distribution section, means defining passages of restricted substantially constant depth and of varying axial length in which the residence time is short and substantially constant, and; (3) a time lag control section having, downstream of said pressure loss control section, means defining passages of enlarged substantially constant depth compared with said pressure control section and of varying axial length in which the pressure loss is small and substantially constant,

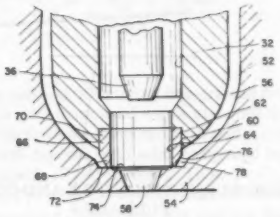
each of said sections having a pressure loss characteristic curve and a residence time characteristic curve the ordinates of which represent pressure loss and residence time of molten polymer flowing axially through each section at various lateral distances from the inlet axis, and wherein at any given lateral distance (1) the sum of the ordinates of the pressure loss characteristic curves of the distribution section and pressure loss control section is substantially a constant value, and (2) the sum of the ordinates of the residence time characteristic curves of the distribution section and time lag control section is substantially a constant value, such that the pressure loss control section compensates for the varying pressure loss in the distribution section and the time lag control section compensates for the varying residence time in the distribution section, and the pressure loss and residence time of molten polymer flowing from said inlet to all points along said orifice defining means is substantially constant.

4,043,740

INJECTION MOLDING NOZZLE SEAL

Jobst Ulrich Gellert, 11 Newton Road, Brampton, Ontario, Canada

Filed June 14, 1976, Ser. No. 695,659
Claims priority, application Canada, Mar. 25, 1976, 248836
Int. Cl.[2] B29F *1/03*
U.S. Cl. 425—567 6 Claims



1. In an injection molding valve-gated mechanism having a vertical valve pin which reciprocates in a bore in a heater cast located in a cavity plate to control flow of molten plastic from a molding machine to a cavity, the heater cast having a lower nozzle portion which is separated from the adjoining cavity plate by an air space and through which a valve pin projects to provide a valve in a gate in the cavity plate to a cavity adjacent the lower tip of the nozzle portion of the heater cast, the improvement wherein a hollow generally cylindrical thermally conductive metallic seal having an upper and a lower portion and a central bore is received in a radially inwardly open cylindrical recess provided in the bore of the nozzle portion of the heater cast, said recess being open axially downwardly and sized to snugly receive said seal so that the surface of the bore of said seal and the axially adjacent surface of the nozzle bore are contiguous, said seal projecting downwardly across the air space and having a horizontal surface received in bearing contact with an annular seat provided on said cavity plate upon vertical thermal expansion of the heater cast.

4,043,741

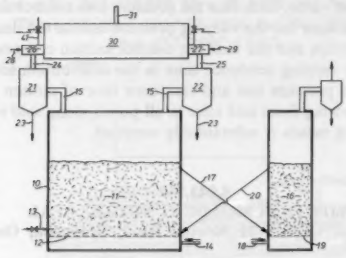
BURNER EQUIPMENT AND OPERATION THEREOF

Gerald Moss, Oxford; Graham Lloyd Johnes, Wantage, and John William Thomas Craig, East Hendred, all of England, assignors to The United States of America as represented by the Administrator, Environmental Protection Agency, Washington, D.C.

Filed Mar. 11, 1976, Ser. No. 665,831
Claims priority, application United Kingdom, Mar. 12, 1975, 10277/75
Int. Cl.[2] F23J *7/00*
U.S. Cl. 431—3 27 Claims

1. A method of removing deposits from fuel combustion equipment in which a fuel having a tendency to form deposits is passed from a source of the fuel to a plurality of fuel burners via flow paths comprising respective fuel conduits, comprising closing off the flow path of fuel gas to one burner at a time, and

passing a deposit-removing reactant into the closed off flow path, in a direction opposite to the normal direction of flow of



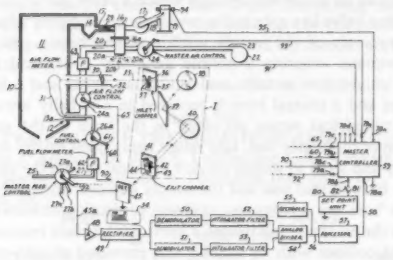
fuel, from a location adjacent to and upstream, of the position of closing off of the fuel flow path.

4,043,742

AUTOMATIC BURNER MONITOR AND CONTROL FOR FURNACES

Dale W. Egan, Covina; Lyman F. Gilbert, Arcadia; Harry C. Lord, West Covina; Alan E. Opel, Monrovia, and Geoffrey B. Holstrom, Claremont, all of Calif., assignors to Environmental Data Corporation, Monrovia, Calif.

Filed May 17, 1976, Ser. No. 687,227
Int. Cl.[2] F23N *5/08*
U.S. Cl. 431—12 **31 Claims**



1. In combination with a furnace of the type having a burner where fuel is burned in the presence of air to create a flame, means for delivering fuel to the burner, and means for delivering air to the burner;

means for viewing the flame and receiving radiation from it over a range of wave lengths radiated from the flame;

means for selecting radiations from the viewing means at the wave length regions of two wave length sets within the range;

means for detecting the intensity of radiations at the selected wave length regions;

means responsive to the detecting means for producing an output signal having a magnitude dependent upon the relationship of the radiation intensities at the selected wave length regions;

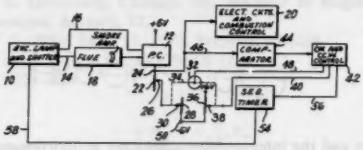
whereby the magnitude of said output signal provides an indication related to the quality of the flame and the fuel-air ratio at the burner.

4,043,743

COMBUSTION CONTROL SYSTEM

Seymour Seider, Hewlett Harbor, N.Y., assignor to B.S.C. Industries Corporation, Hewlett Harbor, N.Y.

Filed Aug. 9, 1976, Ser. No. 712,549
Int. Cl.[2] F23H *5/08*
U.S. Cl. 431—76 **20 Claims**



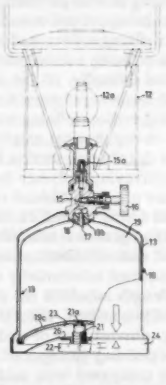
1. Combustion control apparatus comprising combustion means producing smoke incidental to the burning of fuel, combustion control means for controlling combustion in said combustion means as a result of which the density of said smoke is varied, smoke exhaust means defining a path along which said smoke is evacuated, adjustable electrical circuit means for operating said control means, a radiation source, detection means for detecting said radiation, and further means for guiding said radiation through and around the path along which said smoke is evacuated and for adjusting said electrical circuit means to provide a continuously adjustable reference against which measurements of smoke density are made for controlling said combustion, the measurements of smoke density being made by said detection means in accordance with the radiation being guided through said path and the adjustable reference being provided in accordance with the radiation being guided around said path.

4,043,744

BASE OR STAND FOR A CAMPING STOVE

Karl Ernst Svensson, Eskilstuna, Sweden, assignor to Aktiebolaget Optimus, Sweden

Filed Aug. 27, 1975, Ser. No. 608,107
Claims priority, application Sweden, Sept. 4, 1974, 74111873
Int. Cl.[2] F23Q *2/00*; F24C *5/20*
U.S. Cl. 431—142 **5 Claims**



1. A gas container housing for a camping stove, comprising:

a substantially cylindrical housing having a substantially closed upper part and an open lower part, said cylindrical housing adapted to enclose a gas container;

a valve unit rigidly attached to said upper part of said cylindrical housing and including an upwardly directed, threaded portion extending without said housing and an axially downwardly directed puncture means extending downwardly into said housing for puncturing an inserted expendable container;

a cover adapted to engage said open lower part of said housing such that when said housing and said cover are in operational engagement they form a substantially enclosed unit;

an axially extending screw threadably attached to said cover and having a first end extending into said substantially enclosed unit and a second end extending without said substantially enclosed unit;

a spreader plate rotatably connected to said first end of said screw and axially movable with said screw, said spreader plate being adapted to engage the underside of said container such that the container is centered relative to said housing by said spreader plate;

said axially extending screw being rotatable from a first position wherein said spreader plate supports said container a sufficient distance from said upper part of said housing such that said container is not engaged by said puncture means and a second position wherein said container is punctured by said puncture means;

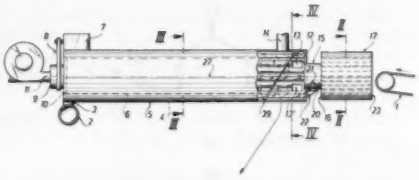
coupling means for selectively coupling said cover to said housing to form a substantially enclosed chamber, said coupling means both retaining said cover on said housing when said valve unit punctures said container and preventing said cover from being removed from said housing when said container is positioned within said housing and said screw is in said second position.

4,043,745

APPARATUS AND PROCESS FOR THE DRYING OF WET, LOOSE MATERIAL, IN PARTICULAR, COKE POWER OR FINES

Günther Unger, 186, Velberterstrasse, Heiligenhaus, Germany (5628)

Filed Feb. 5, 1976, Ser. No. 655,515
Claims priority, application Germany, Sept. 25, 1975, 2542670
Int. Cl.² F27B 7/30, 7/32
U.S. Cl. 432—13 **21 Claims**



1. A process for the drying of wet, pulverulent material while avoiding the generation of air borne dust by means of a burner providing a flame and flue gases extending along an axis, said method comprising the steps of:

moving the wet, pulverulent material along the axis from a point spaced from said burner toward said burner while rotating the material about an axis aligned with the axis of the flame and gases for exposing the materials to the gases for predrying the material down to a predetermined moisture level at or above which dust generation does not occur, said movement and rotation entraining the removed moisture in discharged gases; thereafter

continuing the movement and rotation of the predried material along the axis while placing the material in closed heat transfer relationship with respect to the flame and gases to further dry the material to a terminal moisture level below the predetermined moisture level; and

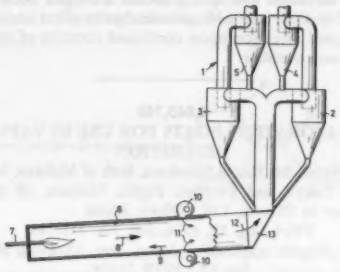
discharging the moisture produced by the further drying of the material.

4,043,746

METHOD FOR THE HEAT TREATMENT OF FINE-GRAINED MATERIALS CONTAINING ALKALI COMPOUNDS

Horst Ritzmann, Enniger, Germany, assignor to Polysius AG, Germany

Continuation-in-part of Ser. No. 507,388, Sept. 19, 1974, abandoned. This application Apr. 23, 1976, Ser. No. 679,806
Int. Cl.² F27B 7/20
U.S. Cl. 432—14 **8 Claims**



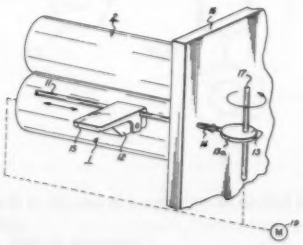
1. A two-stage method of sintering fine-grained raw cement meal containing a solid compound which at a critical temperature lower than the sintering temperature of said material tends to liquify and form deposits, said solid compound being from the group composed of SiO_2, Al_2O_3, TiO_2, Fe_2O_3, Mn_2O_3, CaO, MgO, SO_3, P_2O_5, Na_2O, K_2O, Cl, and mixtures thereof, said method comprising discharging said material from a preheater to one end of a sintering kiln; directing through said kiln from the other end thereof toward said one end hot gases at a temperature sufficiently high to sinter said material; exhausting the gases from said kiln to said preheater to preheat said material prior to its discharge to said one end of said kiln; and introducing cooling air into said kiln adjacent said one end thereof in sufficient quantity and at such temperature to ensure that the temperature of the gases exhausted from said kiln to said preheater is lower than that of said critical temperature.

4,043,747

PRESSURE HEAT FIXING DEVICE

Masuji Ogiwara, Ebina, Japan, assignor to Rank Xerox Ltd., London, England

Filed Sept. 27, 1976, Ser. No. 726,867
Claims priority, application Japan, Aug. 22, 1975, 50-114947
Int. Cl.² G01K 1/14
U.S. Cl. 432—60 **1 Claim**



1. In a pressure heat fixing device comprising a pair of heated fixing rollers rotated in pressure contact with one another and at least one of said rollers having its surface temperature detected by a temperature detecting means in surface contact therewith, the improvement comprising,

temperature detection means pivotally mounted on a shaft

member to contact the surface of said roller, said shaft member extending parallel to the longitudinal axis of said roller,

drive means for imparting a reciprocating movement to said shaft member to move said temperature detection means in a first direction parallel to the axis of said roller and then a second direction opposite said first direction,

said drive means including an eccentric cam member drivingly coupled to said roller whereby upon rotation of said roller said cam member is rotated to effect movement in a first direction and spring means arranged between said shaft member and said cam member to effect movement in a second direction upon continued rotation of said roller and cam member.

4,043,748

EVAPORATION BOATS FOR USE IN VAPOR DEPOSITION

Kiyoshi Watanabe; Kazuo Sunahara, both of Mobara; Motoyasu Terao, Tokyo, and Tsutomu Fujita, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 19, 1976, Ser. No. 715,716

Claims priority, application Japan, Dec. 12, 1975, 50-150560

Int. Cl.[2] F27B *21/04*

U.S. Cl. 432—253 **8 Claims**

1. An evaporation boat comprising superposed upper and lower sheets, said upper sheet having a upwardly convexed central section and a pair of side sections connected to the transverse opposite ends of said central section and bent back toward said central section, said lower sheet having a downwardly convexed central section and a pair of side sections connection to the transverse opposite ends of said downwardly convexed central section and bent inwardly toward said upper sheet and said upper and lower sheets being superposed each other such that said central sections of said upper and lower sheets define a substantially closed chamber for accomodating source material to be evaporated, that slit shaped vapour passages are formed between said upper and lower sheets on the opposite sides of said chamber and that any straight line drawn between any point on the upper surface of the source material contained in said chamber and any point in said passages intersects the inner wall of said upper or lower sheet.

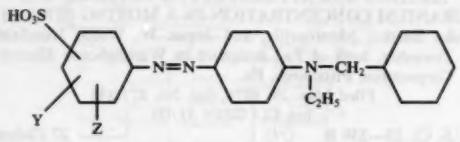
4,043,749

PROCESS FOR DYEING BLENDED NYLON CARPET MATERIAL

Allan M. Huffman, Lock Haven, Pa., assignor to American Color & Chemical Corporation, Charlotte, N.C.

Filed June 22, 1976, Ser. No. 698,754
Int. Cl.[2] D06P *1/38*
U.S. Cl. 8—1 XB 4 Claims

1. In a process for dyeing nylon carpet material tufted or woven of cationic dyeable nylon yarn and acid dye dyeable nylon yarn wherein the nylon carpet material is contacted with a cationic dye and an acid dye in a dyebath, the improvement comprising employing as the acid dye, a monoazo dye of the formula:



or its water soluble sulfonic acid salt, in which Y and Z are independently selected from the group consisting of hydrogen, chlorine, bromine, methyl and methoxy.

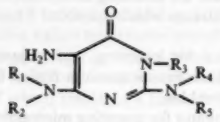
4,043,750

DEVELOPER-COUPLER HAIR DYES BASED ON TRIAMINO-PYRIMIDINONES

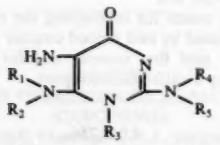
Hans Peter Kubersky, Solingen, and Erwin Weinrich, Haan, both of Germany, assignors to Henkel & Cie GmbH, Dusseldorf, Germany

Filed Apr. 5, 1976, Ser. No. 673,456
Claims priority, application Germany, Apr. 12, 1975, 2516118
Int. Cl.[2] A61K *7/13*
U.S. Cl. 8—10.2 15 Claims

1. A composition of the developer-oxidizer type for the dyeing of hair, consisting essentially of, as developer, a water-soluble substituted 2,5,6-triamino-4-pyrimidinone of the formulae:



or



wherein R_1-R_5 each represent hydrogen, C_{1-4} alkyl, C_{1-4} hydroxyalkyl, phenyl, phenyl C_{1-4} alkyl, C_{1-4} alkoxyphenyl, C_{1-4} alkyl, and di-(C_{1-4} alkyl) aminophenyl, and wherein either or both of the R_1-R_2 and R_4-R_5 pairs, together with the nitrogen atom to which they are respectively attached, form a 5- or 6-membered heterocyclic ring, optionally containing another nitrogen atom or an oxygen atom, and a water-soluble coupler therefor, said developer and said coupler being present in the molar range of about 2:1 to 1:2.

2. An aqueous emulsion for dyeing the hair having a content of 0.2% to 5% by weight of the developer-coupler composition of claim 1.

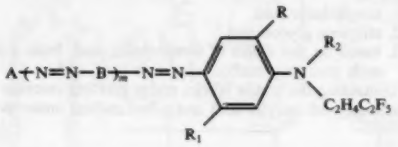
4,043,751

PROCESS FOR COLORING FIBERS WITH WATER-INSOLUBLE POLYFLUORO AZO DYESTUFFS

Jacques Pierre Edmond Pechmeze, Paris, and Robert Frederic Michel Sureau, Enghien les Bains, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Division of Ser. No. 416,913, Nov. 19, 1973, abandoned. This application Nov. 4, 1975, Ser. No. 628,722
Claims priority, application France, Nov. 17, 1972, 72.40827
Int. Cl.[2] C09B *27/00*; D06P *1/02*
U.S. Cl. 8—41 C 4 Claims

1. Process for the coloration of fibers based on polyester, said process comprising coloring said fiber with a dyestuff of the formula:



in which R represents hydrogen, alkyl or alkoxy, R_1 represents hydrogen, chlorine, alkyl, alkoxy or acylamino or a diene grouping linked to the benzene nucleus to form a naphthalene nucleus, R_2 represents hydrogen, alkyl, hydroxyalkyl or cyanoethyl, B represents an aromatic radical, *m* is 0 or 1 and A represents a benzene or hetercyclic radical, the residues A and B being unsubstituted or substituted by substituents which do not give rise to an acid dissociation.

4,043,752

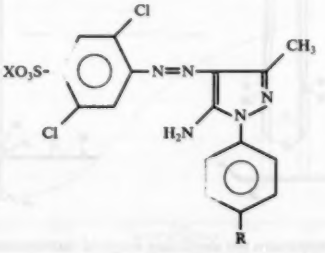
PHENYLAZOAMINOPHENYLPYRAZOLE ACID DYE SOLUTIONS CONTAINING TWO NONIONIC SURFACTANTS

Lindsay Kilmurry, Newark, Del., and Howard Kirby Urion, Woodstown, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 17, 1975, Ser. No. 641,373
Int. Cl.[2] D06P *1/06, 1/645, 3/24*
U.S. Cl. 8—41 B 14 Claims

1. the dye solution comprising by weight,

i. 10% to 20% of a dye of the formula



wherein R is H or Cl, and X is a mixture of di- and tri- C_{1-4}alkanolammonium,

ii. 15% to 30% of n-butanol,

iii. 10% to 20% of ethyleneglycol,

iv. 10% to 20% of nonionic polyethylene oxide-polypropylene oxide copolymer surfactant,

v. 5% to 10% of nonionic polyethoxylated aliphatic amine surfactant, and

vi. 0 to 50% water.

4,043,753
GRAFTING PROCESS FOR PREPARING A POLYESTER FABRIC HAVING DESIRABLE STAIN-RELEASE, ANTISOIL-REDEPOSITION, ANTISTATIC AND HYDROPHILIC PROPERTIES

Robert B. Barbee, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 418,162, Nov. 21, 1973, now Defensive Publication No. T939,008. This application Mar. 1, 1976, Ser. No. 662,673

Int. Cl.[2] D06G *1/02;* **C08G** *63/12*

U.S. Cl. 8—115.5 **2 Claims**

1. A process comprising

A. preparing a textile fabric of fibers formed from a polyester of

1. terephthalic acid,
2. ethylene glycol, and
3. based on the moles of terephthalic acid, from 1 to 10 mole percent p-carboxycinnamic acid, and

B. contacting the textile fabric, under grafting reaction conditions, with acrylic acid and a free radical initiator.

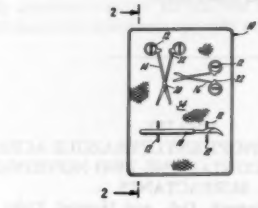
4,043,754
INSTRUMENT STERILIZING PIN

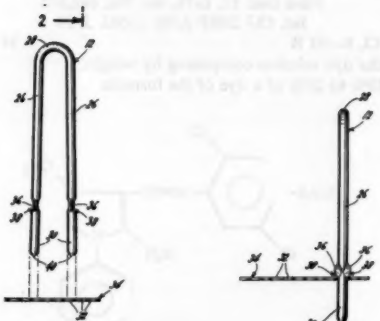
Alan L. Sklar, Hewlett Harbor, N.Y., assignor to J. Sklar Mfg. Co., Inc., Long Island City, N.Y.

Continuation of Ser. No. 528,982, Dec. 2, 1974, abandoned. This application June 28, 1976, Ser. No. 700,543

Int. Cl.[2] A61L *3/00, 3/02*

U.S. Cl. 21—82 R **1 Claim**





1. An apparatus for sterilizing surgical instruments comprising a sterilizing tray of the type containing a bottom surface of perforated metal and a plurality of instrument sterilizing pins engaged in said bottom surface wherein each instrument sterilizing pin is comprised of a body portion having a pair of substantially parallel straight segments connected by an intermediate segment having a bend occupying a plane formed by said straight segments, each of said straight segments including a stop means consisting of a widened portion of said straight segment and an engaging segment in coaxial alignment with said straight segment, said engaging segments are engagable in perforations in said bottom surface of said sterilizing tray in perforations spaced from each other such a distance that when said engaging segments are engaged in said bottom surface of said tray said sterilizing pins are maintained in a resiliently deflected state with the deflection of said body portion causing said engaging segments to apply a retention force on the sides of the perforations in said bottom surface of said sterilizing tray, said widened portion comprising a lateral ear extending from said substantially straight segment adjacent said engaging segment whereby the effective diameter of said stop means is greater than the diameter of said perforation in said bottom surface of said sterilizing tray.

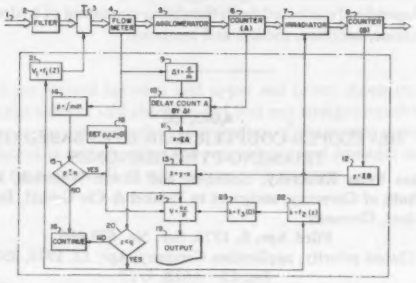
4,043,755
METHOD AND APPARATUS FOR DETERMINING URANIUM CONCENTRATION IN A MOVING STREAM

John Bartko, Monroeville, and James W. Wonn, Hemfield Township, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 29, 1976, Ser. No. 671,886

Int. Cl.[2] G01N *31/00*

U.S. Cl. 23—230 R **27 Claims**



14. Apparatus for determining uranium concentration in a moving liquid stream comprising:

A. an agglomerator for increasing the size of microbubbles in said stream which are about 6 to about 10 microns until they are larger than about 10 microns;

B. a first counter for counting microbubbles in a given volume of said stream which are about 6 to about 10 microns in size;

C. an irradiator for exposing said stream to a source of radiation which causes uranium fission fragments to produce microbubbles;

D. a second counter for counting microbubbles in said given volume of said stream which are about 6 to about 10 microns in size; and

E. calculating means for subtracting the number of microbubbles counted by said second counter from the number counted by said first counter and for multiplying the difference by a calibration constant.

4,043,756
CALIBRATION IN AN AUTOMATIC CHEMICAL TESTING APPARATUS

David E. Sommervold, Houston, Tex., assignor to Hycel, Inc., Houston, Tex.

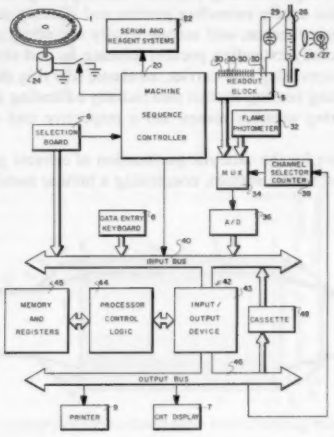
Filed Dec. 29, 1976, Ser. No. 758,055

Int. Cl.[2] G01N *33/16, 21/24, 21/58*

U.S. Cl. 23—230 R **22 Claims**

17. In an automatic chemical testing method comprising in each of a plurality of channels a readout signal indicative of optical density of an aliquot of a sample wherein the wavelength at which optical density of a sample aliquot is measured is selected in correspondence with a particular chemistry being performed and the optical density at that wavelength is a function of the concentration of a particular substance therein

for the particular chemistry, calculating in processing means a value of concentration units corresponding to the optical density indicated by each of the readout signals, wherein said processing means utilizes a predetermined curve function for each channel and wherein the predetermined curve function must be calibrated by the measurement of a blank sample and a reference sample each having a known concentration level of substance therein to provide calibration values indicative of a baseline and of a reference level for values of readout signals, and providing readout signals for a plurality of substantially identical blank samples and for a plurality of substantially identical reference samples, the improvement of a method for



providing calibration values for each channel to said processing means comprising: obtaining a blank readout signal for each blank sample having a blank value, supplying each said blank value to said processing means for obtaining a respective blank concentration value based on the use of the said blank value as a calibration value, comparing selected ones of said blank concentration values for measuring blank error between blank concentration values, comparing at least one of said blank concentration values to a known stored blank concentration value, and supplying a successful blank value to said processing means as a calibration value, where a successful value is one the use of which results in a blank error below a preselected level.

4,043,757

METHOD FOR DETECTION OF HUMAN MAMMARY CARCINOMA

Paul Arlen Wagstaff, Flemington, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed May 20, 1975, Ser. No. 579,105
Int. Cl.[2] G01N *21/08, 33/16*
U.S. Cl. 23—230 B **9 Claims**

1. A method for detecting human mammary carcinoma which comprises the steps of:

A. separating the leucocytes from a blood sample removed from a suspected mammary carcinoma host;

B. incubating said leucocytes at a temperature of from about 0° to about 25° C;

C. mixing said incubated leucocytes with mammary tumor extract; and

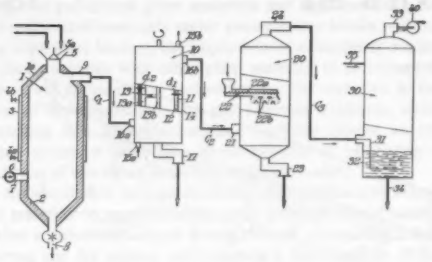
D. incubating said mixture while periodically measuring the pH of said mixture with a pH detecting means.

4,043,758

APPARATUS FOR THE MANUFACTURE OF METALLIC CHLORIDES

Constantin Tsirigotis, Athens, Greece, assignor to Larco Societe Miniere et Metallurgique de Larymna S.A., France

Division of Ser. No. 375,093, June 29, 1973, Pat. No. 3,935,293.
This application Sept. 22, 1975, Ser. No. 615,508
Claims priority, application Luxembourg, Mar. 6, 1973, 67161
Int. Cl.[2] B01D *5/00*
U.S. Cl. 23—262 **1 Claim**



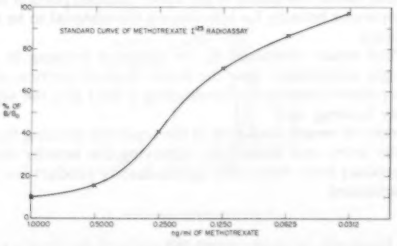
1. In an installation for the manufacture of metallic chlorides, starting from a raw material containing as an alloy at least two of the metals from the group Fe, Ni, Cr, Cu and Co, said installation including (i) a chlorinating enclosure in which said alloys are firstly subjected to a chlorination operation and (ii) at least one recovery enclosure for the chlorides formed comprising an externally cooled envelope at the inner surface of which are deposited the said chlorides in the form of a layer, the improvement wherein scraper means are provided within said recovery enclosure for controlling the thickness of said layer of chlorides at the inner surfaces of said externally cooled envelope such that a said thickness of between about 2 to 15 mm. remains on said surface.

4,043,759

METHOD OF DETERMINING METHOTREXATE

Stanley E. Charm, and Henry E. Blair, both of 136 Harrison Ave., Boston, Mass. 02111

Filed Jan. 20, 1976, Ser. No. 650,690
Int. Cl.[2] G01N *33/16, 31/06;* A61K *43/00*
U.S. Cl. 23—230.6 **17 Claims**



1. A method for the quantitative determination of methotrexate in a sample containing at least about 0.03 nanograms per milliliter of free methotrexate, which method comprises:

a. mixing a known amount of the enzyme dihydrofolate reductase and a known amount of I^{125} labeled methotrexate to the sample and allowing the mixture to stand for a period of at least about 5 minutes to permit the competitive binding of the sample and labeled methotrexate;

b. removing free unbound methotrexate;

c. measuring the gamma ray count of the I^{125} labeled bound

methotrexate in the remaining sample which is essentially free of unbound methotrexate; and

d. determining the amount of methotrexate in the sample by comparison of the measured gamma ray count with standard quantitative data.

4,043,760

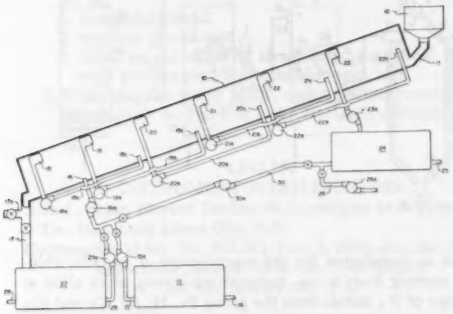
COUNTER CURRENT DECANTATION APPARATUS

Martin H. Hiatt, 993 Vernon Ave., Venice, Calif. 90291

Filed Aug. 11, 1975, Ser. No. 603,695

Int. Cl.[2] B01D *11/00, 59/24*

U.S. Cl. 23—270 R **5 Claims**



1. A separation apparatus for the fluid counter current separation of products having different solvent absorptive capacities or densities which comprises:

a. a longitudinal separator housing mounted on an inclined plane,

b. a plurality of decantation pipes longitudinally spaced and extending through the separator housing in a fluid tight relationship, said pipes extending upwardly into the separator housing a distance and terminating in expanded openings sufficient to withdraw all of the fluid flowing over and into said openings,

c. pump means and piping connected to the lower end of each decantation pipe for removing the fluid flowing through each decantation pipe and pumping said fluid back through the separator housing at a point upstream of the next adjacent decantation pipe and at a distance above the separator housing floor with the exception that the pump means connected to the most forward decantation pipe removes the fluid and lighter density product thus recovered from the separator housing,

d. feed means contained in the upper inclined portion of the separator housing for introducing the material to be separated,

e. feed means contained in the separator housing in fluid tight relationship near the lower inclined portion of the separator housing for introducing a fluid into the separator housing, and

f. removal means contained in the separator housing floor at the lower end thereof for removing the heavier density product from which the lighter density product has been separated.

4,043,761

CATALYTIC CONVERTER HAVING RESILIENT MONOLITH-MOUNTING MEANS

Gerhard Gaysert, Esslingen (Neckar), and Walter Ottle, Faurndau, both of Germany, assignors to J. Eberspacher, Germany

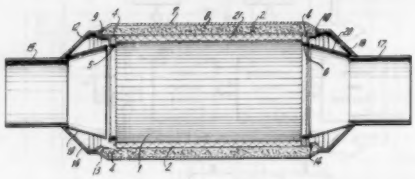
Continuation of Ser. No. 554,661, March 3, 1975, abandoned. This application Oct. 15, 1976, Ser. No. 732,877

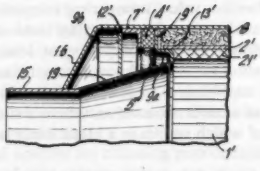
Int. Cl.[2] F01N *3/15, 7/00*

U.S. Cl. 23—288 FC **5 Claims**

1. A device for the catalytic purification of exhaust gases of internal combustion engines, comprising a tubular metal housing having an exhaust gas supply connection at one end and an exhaust gas discharge connection at an opposite end and defining a gas flow passage therethrough, a tubular casing of sheet metal within said housing and spaced radially inwardly from the interior walls thereof, a substantially cylindrical monolithic catalyst carrier disposed in the exhaust gas flow passage within said housing and spaced radially inwardly from said casing, said carrier having axially extending passages therethrough for the flow of exhaust gases therethrough, a radially prestressed compacted metal mesh disposed between said carrier and said casing and forming an elastic support for said carrier, annular bearing member means having a first axially extending portion fixedly connected to a respective end of said tubular housing, a second axially extending portion offset radially inwardly from said first axially extending portion and slidably supporting said casing thereon, said second axially extending portion having a radially extending portion forming an end abutment for axially supporting said carrier, an elastic seal ring disposed in said housing bearing against said radially extending portion of said bearing member means and a respective end of said carrier.

5. A device for the catalytic purification of exhaust gases of internal combustion engines, comprising a tubular metal housing having an exhaust gas supply connection at one end and an exhaust gas discharge connection at an opposite end and defining a gas flow passage therethrough, a tubular casing of sheet metal within said housing and spaced radially inwardly from the interior walls thereof, a substantially cylindrical monolithic catalyst carrier disposed in the exhaust gas flow passage within said housing and spaced radially inwardly from said casing, said carrier having axially extending passages therethrough for the flow of exhaust gases therethrough, a layer of insulation disposed between said housing and said casing, a radially prestressed compacted metal mesh disposed between said carrier and said casing and forming an elastic support for said carrier, a first inner annular bearing member arranged at at least one end of said housing and having a first radially extending portion abutting an end of said layer of insulation, and having an axially extending first portion slidably supporting said casing and a second radially extending portion abutting against an end of said carrier, an elastic ring abutting against said first radially extending portion of said first annular member, a second annular member having a third radially extending portion abutting against the opposite end of said ring and a second axially extending portion fixedly secured to said tubular housing.



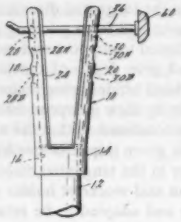


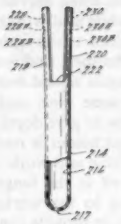
4,043,762

COUPLING MEANS FOR TEST TUBES AND THE LIKE

George Milton Olds, 3401 Glasgow Drive, Lansing, Mich. 48910

Filed Oct. 6, 1976, Ser. No. 729,964
Int. Cl.[2] B01L 9/06, 9/00, 3/14; B65D 37/00
U.S. Cl. 23—292 18 Claims





14. A unitary combined test tube and coupling means formed of flexible, resilient material and comprising a tubular body portion open at one end and closed at the opposite end thereof, said unitary combined test tube and coupling means also including a pair of equally circumferentially spaced, opposed flange portions formed integrally with said body portion and projecting longitudinally outwardly from said one end of said tubular body portion, said flange portions each defining a transverse opening disposed at a position near, but spaced from, the free end thereof, each of said openings being located along a plane that includes the longitudinal axis of said tubular body portion whereby the openings in said flange portions are located generally across from each other.

4,043,763

STABILIZATION OF DRIED COAL

Oscar L. Norman, Wilmington, Del., and Walter H. Seitzer, West Chester, Pa., assignors to Suntech, Inc., Wayne, Pa.

Continuation-in-part of Ser. No. 676,026, April 12, 1976, abandoned. This application Jan. 7, 1977, Ser. No. 758,890
Int. Cl.[2] C10L 5/00
U.S. Cl. 44—1 R 7 Claims

1. A process for stabilizing lignite and sub-bituminous coal against spontaneous combustion which comprises drying said coal to a moisture level of from 0 to about 10% by weight and mixing said dried coal at a temperature of from about 80° to about 300° C with as-mined coal in a weight ratio of dried coal to as-mined coal of from about 1:2 to about 10:1.

4,043,764

PROCESS FOR MANUFACTURING COMBUSTIBLE BRICKS FROM PLANT MATERIALS

Daniel Loas, Paris, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Apr. 16, 1976, Ser. No. 677,848
Claims priority, application France, Apr. 18, 1975, 75.12086
Int. Cl.[2] C10L 5/00, 5/22
U.S. Cl. 44—10 A 11 Claims

1. In a process for manufacturing combustible bricks from plant materials comprising pulverizing the plant materials, drying the pulverized plant materials and agglomerating the dried pulverized materials under pressure into bricks without using additional binders, the improvement comprising mixing the plant materials with other plant materials in an advanced stage of self fermentation and subjecting the materials in the course of the fermentation to a pulverisation treatment, while controlling said fermentation until particles having an expanded structure have been obtained without producing a separation of the lignin from the cellulosic tissues.

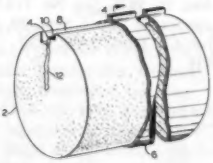
8. An installation for manufacturing combustible bricks from plant materials by agglomeration under pressure of said materials after a pulverization and drying thereof, comprising a first metering silo for mixing and initiating a fermentation of the plant materials, a device for shredding the materials issuing from the first silo, a second silo provided with a stirring and mixing device for effecting a fermentation of the materials issuing from the second silo, a device for pulverizing the materials issuing from the second silo, and a third silo for effecting a fermentation of the pulverized materials.

4,043,765

ARTIFICIAL FIREPLACE LOGS WITH IGNITION STRIPS

David John Tanner, Oshawa, Canada, assignor to Linwo Industries Ltd., Ontario, Canada

Continuation-in-part of Ser. No. 596,023, July 11, 1975, abandoned. This application Apr. 30, 1976, Ser. No. 681,991
Int. Cl.[2] C10L 5/36, 11/00
U.S. Cl. 44—14 30 Claims



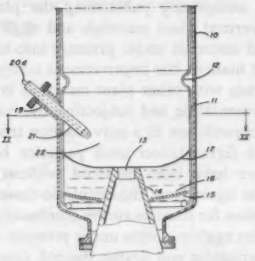
1. An artificial fireplace log, comprising an elongated form retaining body having an outer surface and formed of a material capable of self-sustaining combustion, at least one groove on the outer surface of said body in longitudinal alignment therewith, at least one ignition strip integral with and disposed in at least one of said grooves.

30. An artificial fireplace log, comprising an elongated form retaining body having an outer surface and formed of a material capable of self-sustaining combustion, said outer surface having deposited thereon a stream of combustible powder or solid particles.

4,043,766
SLAG BATH GENERATOR

Paul Gernhardt, Bochum; Wolfgang Grams, Wanne-Eickel; Wilhelm Danguillier, and Siegfried Pohl, both of Bochum, all of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Oct. 26, 1976, Ser. No. 735,180
Claims priority, application Germany, Nov. 20, 1975, 2552077
Int. Cl.² C10J *3/30*
U.S. Cl. 48—73 **14 Claims**



1. A slag bath generator including the combination of:

a vessel defining a vertical and substantially cylindrical reactor shaft within a side wall of the vessel, said vessel including a base for maintaining a liquid slag bath at the bottom of the reactor shaft,

a slag bath overflow projecting centrally within said vessel to discharge liquid slag of the slag bath from the vessel,

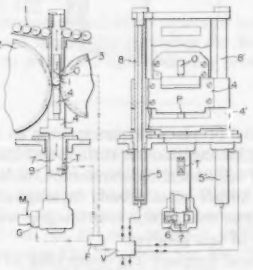
a plurality of nozzles to introduce jet streams of fine-grain fuel and a gasification medium downwardly toward the surface of said slag bath, and

supports positioning said nozzles to direct said jet streams downwardly within the reactor shaft at an angle within the range of 35° to 40° with respect to the horizontal, the supports further positioning said nozzles to direct said jet streams of fine-grain fuel and gasification medium at points of impingement with the surface of the liquid slag bath defined on a plurality of concentric circles with respect to said overflow to circulate and produce a resulting movement of the liquid slag toward the overflow for maintaining a high temperature and homogeneous slag bath.

4,043,767
CENTERLESS GRINDING MACHINE USING TANGENTIAL-FEED METHOD

Minoru Suda, 220-1, Ohdo, Yono, Saitama, Japan

Filed Aug. 16, 1976, Ser. No. 714,989
Claims priority, application Japan, Sept. 20, 1975, 50-113132
Int. Cl.² B24B *5/22, 5/32*
U.S. Cl. 51—103 WH **11 Claims**



1. In a centerless grinding machine of tangential feed type including a grinding wheel adapted to rotate under high speed and a regulating wheel adapted to rotate under low speed in the same direction as said grinding wheel, in which said grinding wheel and regulating wheel are provided at the upper surface of a bed, and a work holder is moved in a tangential direction common to both of said grinding wheel and regulating wheel between said grinding wheel and regulating wheel, so as to give depth of cut to a workpiece, said machine characterized by a work holder which is divided into a workrest (4) adapted to move reciprocatively in the tangential direction for loading and unloading workpieces to and from grinding position and a workrest holder (4') adapted to support said workrest during grinding operation and give depth of cut to the workpiece, said workrest and workrest holder being reciprocatively moved under the same cycle by their independent driving mechanisms and adapted to be combined so that the workpiece held within said workrest is given depth of cut by the movement of said workrest holder in the tangential direction, said workrest being separated from said workrest holder upon completion of grinding operation and adapted to be returned upwardly in a short time and, after the workpiece held within said workrest is unloaded and the next workpiece is set, said workrest being moved into grinding position again in a short time, while said workrest holder being returned upwardly to the position to start grinding immediately after grinding operation is finished, said workrest and workrest holder being combined again as said workrest moves into grinding position and at the same time, said workrest holder being moved in the direction to give depth of cut to the workpiece as soon as said workrest holder is returned upwardly, so that the workpiece held within said workrest is given depth of cut as said workrest is moved in the tangential direction, thus giving centerless grinding to the workpiece repeatedly, whereby it becomes possible to provide centerless grinding with high aaccuracy, to shorten the idling time in the centerless grinding machine as well as to fully automatize the machine in an easy manner.

4,043,768
METHOD OF CONDITIONING FLUE GAS TO ELECTROSTATIC PRECIPITATOR

Robert P. Bennett, Bridgewater, and Matthew J. O'Connor, Flanders, both of N.J., assignors to Apollo Chemical Corporation, Whippany, N.J.

Filed Apr. 5, 1976, Ser. No. 673,364
Int. Cl.² B03C *1/00*
U.S. Cl. 55—5 **28 Claims**

1. A method of improving the collection characteristics of particles entrained in a stream of particle-laden gas formed by the burning of coal for collection by an electrostatic precipitator, comprising forming a mixture

A. the particle-laden gas at a temperature of 590°–900° C., and

B. finely divided ammonium bisulfate; said mixture containing 75–1,250 grams and ammonium bisulfate per metric ton of coal burned to form said gas, and

C. after forming said mixture, directing said gas stream through a heat exchange means and into an electrostatic precipitator to collect said particles therein.

4,043,769
PROCESS FOR RECOVERING A SOLVENT VAPOR

Mutsumi Nishino, Chigasaki; Hideo Sasaki, Tokyo; Kazumi Uda, Fukuyama; Motohiko Tamura, Mihara; Kunihiko Hiyama, Mihara, and Hiroshi Fujiike, Mihara, all of Japan, assignors to Mitsubishi Jukogyo Kabuskiki Kaisha and Shell Sekiyu Kabushiki Kaisha, both of Tokyo, Japan

Filed Dec. 15, 1975, Ser. No. 640,564
Int. Cl.² B01D *53/16*
U.S. Cl. 55—25 **2 Claims**

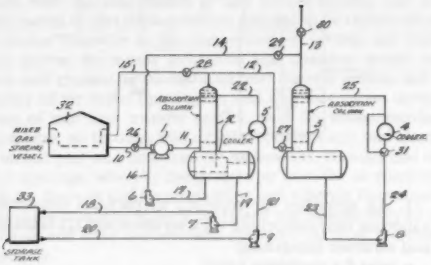
1. A process for recovering a solvent vapor from a mixture of the solvent vapor and air comprising

a. passing a mixed gas taken from a storing vessel for a mixed gas of a solvent vapor and air through a compressor to

compress the mixed gas to a low degree and introducing the lightly compressed mixed gas to a first absorption column, bringing the lightly compressed gas into vapor-liquid contact with a first absorbent to absorb and recover a greater part of the solvent vapor in said first absorption column, and

b. introducing a gas coming out of the first absorption column to a second absorption column and bringing said gas into vapor-liquid contact with a second absorbent circulating while being cooled in said second absorption column;

c. after saturation of the second absorbent, by the solvent vapor, stopping the flow of said mixed gas to a compressor and returning a gas coming out from said first absorption column to a vessel storing said mixed gas, and at the same time performing



d. causing said compressor to act as a vacuum pump and forwarding a gas from the second absorption column into the first absorption column to reduce the pressure inside the second absorption column, evaporating and gasifying a solvent component absorbed in substantially saturated state in the second absorbent, which is thereby cooled to regenerate the second absorbent;

e. subsequently introducing an evaporated and gasified gas consisting mainly of the solvent vapor to the first absorption column, bringing said gas into vapor-liquid contact with the first absorbent to absorb and recover the solvent vapor, returning a gas containing a trace of the solvent vapor, which has not been absorbed and recovered, to said mixed gas storing vessel or supplying a part of said gas to the second absorption column to exclude the solvent component in the second absorbent.

4,043,770

ABSORPTION-ADSORPTION SYSTEM FOR PURIFYING CRYOGENIC GASES

Fritz Jakob, Achmuhle, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Dec. 19, 1975, Ser. No. 642,602

Claims priority, application Germany, Dec. 20, 1974, 2460515

Int. Cl.[2] B01D *53/04;* **F25J** *3/06*

U.S. Cl. 55—62 **26 Claims**

1. In the purification of semi-pure gas containing a minor quantity of a gaseous impurity, the steps comprising:

a. passing said semi-pure gas at a temperature substantially above the condensation temperature of said gaseous impurity through a first adsorber loaded with said gaseous impurity to the extent of having a pressure of gaseous impurity emanating from the adsorbed impurity higher than the partial pressure of said gaseous impurity in the semi-pure gase, to desorb and entrain said gaseous impurity, thereby regenerating said first adsorber;

b. cooling resultant desorption gas containing said gaseous impurity to below the condensation temperature of said gaseous impurity to partially liquefy said gaseous impurity;

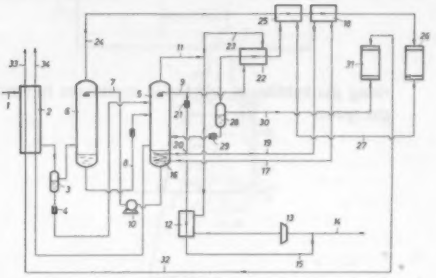
c. separating said liquefied gaseous impurity from equilibrium gas containing residual amounts of said gaseous impurity; and

d. passing said equilibrium gas, at a temperature below said condensation temperature of said gaseous impurity in step (b), through a second adsorber previously regenerated as in step (a), and removing at least a portion of said residual amounts of gaseous impurity to yield a purified gas.

17. In the purification of semi-pure gas containing a minor quantity of a gaseous impurity, the steps comprising:

a. scrubbing crude gas with liquid to yield scrubbed semi-pure gas containing said liquid in gaseous form as said gaseous impurity;

b. passing resultant semi-pure gas at a temperature substantially above the condensation temperature of said gaseous impurity through a first adsorber loaded with said gaseous



impurity to the extent of having a pressure of gaseous impurity emanating from the adsorbed impurity higher than the partial pressure of said gaseous impurity in the semi-pure gas;

c. cooling resultant desorption gas containing said gaseous impurity to below the condensation temperature of said gaseous impurity to partially liquefy said gaseous impurity;

d. separating said liquefied gaseous impurity from equilibrium gas containing residual amounts of said gaseous impurity; and

e. passing said equilibrium gas at a temperature below said condensation temperature of said gaseous impurity of step (c) through a second adsorber previously regenerated as in step (b), and removing at least a portion of said residual amounts of gaseous impurity to yield a purified gas.

4,043,771

METHOD OF AND APPARATUS FOR THE DISSOLUTION OF GASES IN LIQUIDS

Satish Kumar Anand, Deisenhofen, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Feb. 23, 1976, Ser. No. 660,511

Claims priority, application Germany, Feb. 22, 1975, 2507698

Int. Cl.[2] B01D *47/02;* **C02C** *1/02, 5/02, 5/10*

U.S. Cl. 55—93 BN **7 Claims**

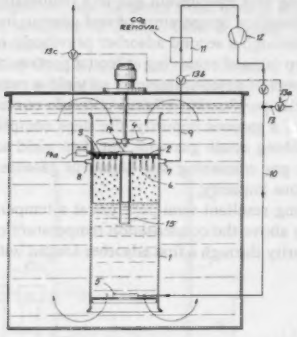
1. A process for the dissolution of gas in a liquid in a vessel, comprising the steps of:

circulating the liquid through an upright column occupying only a portion of the volume of said vessel;

subdividing the liquid flow in said column at an upper portion thereof into a multiplicity of partial streams and spraying said streams into a gas space maintained above a liquid level in said column;

supplying gas to said space for solubilization in the liquid by passing bubbles upwardly through a liquid continuum in said column from the bottom thereof and releasing a portion of said bubbles into said space at said liquid level within said column; and

maintaining the flow velocity of the liquid continuum in said column at a level sufficient to permit only a portion of the



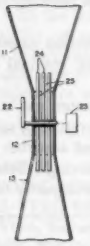
rising gas bubbles in said liquid continuum to reach said gas space.

4,043,772

VENTURI SCRUBBER WITH VARIABLE AREA THROAT

Alvin S. Lundy, West Bloomfield, Mich., assignor to Schneible Company, Holly, Mich.

Filed Nov. 7, 1975, Ser. No. 629,777
Int. Cl.² B01D *47/10*
U.S. Cl. 55—220 **8 Claims**



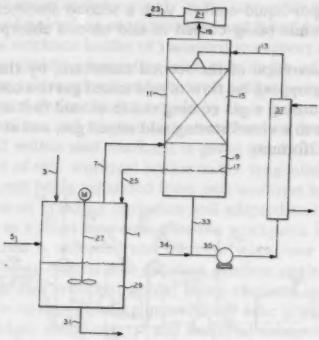
1. A wet gas venturi scrubber comprising a venturi tube having a gas inlet and a gas outlet and defining a narrowed throat therebetween, gas moving means for moving a stream of gas through said tube, and liquid injection means for injecting a cleansing liquid into said gas upstream of said throat, wherein the improvement comprises a rotor disposed in said throat and including a transverse pivot shaft extending between opposite sides of said throat and mounted for rotation about the axis thereof, said rotor also including a plurality of spaced parallel members being disposed within said throat and being perpendicular with and secured to said shaft, said rotor having spaces between said members of substantial width in relation to the width of said members and being rotatable into any selected angular position between a first position permitting a maximum flow through said throat wherein said members extend longitudinally of said throat and a second position permitting a minimum flow through said throat wherein said members extend transversely of said throat, said spaces permitting a substantial flow through said throat even when said rotor is in said second position.

4,043,773

RECOVERY OF POLYMER PARTICLES ENTRAINED IN TANK VENT

Jack S. Scoggin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 10, 1976, Ser. No. 684,987
Int. Cl.² B01D *47/14*
U.S. Cl. 55—228 **4 Claims**



1. An apparatus for recovery of particles entrained in a vaporous vent comprising (1) a scrubber and (2) tankage with said scrubber comprising:

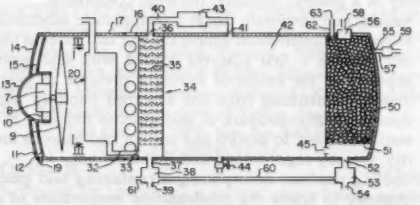
a. inlet for scrubbing liquid,
b. vent for vapor above the scrubbing liquid inlet,
c. liquid outlet at the base of the scrubber for removal of scrubbing liquid,
d. a second liquid outlet sufficiently above the scrubbing liquid outlet to maintain a liquid level in the base of the scrubber with overflow from the second outlet,
e. means for maintaining a liquid level in the scrubber base, and
f. inlet for vaporous vent containing entrained particles above second liquid outlet and below the scrubber liquid inlet and said tankage comprising:
g. a tank, connected by
h. a first conduit to permit venting through said conduit from the tank to the inlet for vaporous vent of the scrubber, and connected by
i. conduit from the second liquid outlet of the scrubber to the vent space of the tank, said tank positioned sufficiently lower than said scrubber to provide gravity flow of liquid from the second liquid outlet of the scrubber to the vent space of the tank.

4,043,774

APPARATUS FOR AIR PURIFICATION

Doyle Wayne McGrath, 135 Abbeyville Road, Abbeyville Apt. No. 204, Pittsburgh, Pa. 15228

Filed Apr. 26, 1976, Ser. No. 680,589
Int. Cl.² B01D *53/04, 53/26*
U.S. Cl. 55—269 **8 Claims**



1. An air purification unit for use in a compressed air system

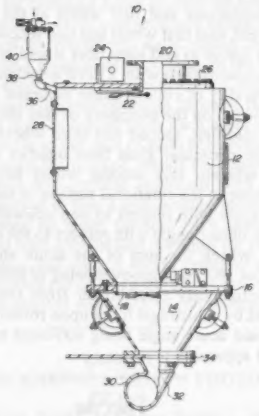
including an air compressor, a discharge line from said air compressor, a filter in said discharge line and a compressed air service reservoir; said air purification unit comprising a unitary chamber means, closure means at the inlet end of said chamber means, said closure means formed with a plurality of air inlet openings; a plurality of serially connected sections located within said unitary chamber means; said sections including a heat transfer section spaced from said closure means, a filter and expansion section, a supply reservoir section and a drying section; inlet means and outlet means for each of said sections, the inlet means of said heat transfer section adapted to be connected to the discharge line from the air compressor downstream of the filter and the outlet means of said heat transfer section connected with the inlet means of said filter and expansion section, the outlet means of said filter and expansion section connected with the inlet means of said supply reservoir section, the outlet means of said supply reservoir section connected with the inlet means of said drying section, and the outlet means of said drying section adapted to be connected to the service reservoir in the compressed air system; and positively driven fan means located in said chamber means between said closure means and said heat transfer section and a plurality of air outlet openings in said chamber means downstream of said heat transfer section, said fan means moving atmospheric air through said air inlet openings into said chamber means, past said heat transfer section and through said air outlet openings; whereby compressed air from the air compressor flows through said air purification unit wherein the temperature of the compressed air is decreased and substantially all of the liquid and solid contaminants are removed from the compressed air.

4,043,775

AIR LOCK FILTER SYSTEM

Richard L. Solomon, Selinsgrove, Pa., assignor to Ecolaire Inc., Philadelphia, Pa.

Filed Dec. 29, 1975, Ser. No. 644,656
Int. Cl.² B01D *46/04*
U.S. Cl. 55—302 **11 Claims**



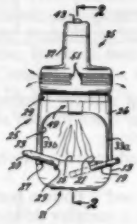
1. An air lock filter system comprising a pressure vessel having a materials inlet at an elevation above the elevation of a materials outlet from said pressure vessel, a housing supported adjacent the upper portion of said vessel and having a dirty gas inlet and a vent outlet, said dirty gas inlet communicating with the upper end of said vessel, a first valve means operatively connected to said housing by way of said vent outlet for selectively venting the housing and for connecting the housing to a source of gas under pressure, second valve means for controlling the inlet and outlet of said pressure vessel, a hollow filter tube in said housing arranged so that the interior of said tube communicates at one end with said vent outlet and thereby with said first valve means, means closing the other end of said tube, said tube being a rigid porous refractory, and means supporting said tube in said housing to prevent gas passing through said housing from by-passing said filter tube so that the outer periphery of said tube is exposed to gas entering the housing by way of said dirty gas inlet, whereby gas will be filtered through the outer periphery of said tube into the interior thereof.

4,043,776

SMOKE SORBING DEVICE

Jeannette V. Orel, 522 Warner Ave., Los Angeles, Calif. 90024

Continuation-in-part of Ser. No. 488,229, July 15, 1974, abandoned. This application Oct. 30, 1975, Ser. No. 627,125
Int. Cl.² B01D *50/00*
U.S. Cl. 55—385 G **10 Claims**



1. A smoke sorbing and filtering ashtray device comprising an ashtray including a wall terminating in a rim for supporting an object having a smoke producing end such as a cigar or cigarette and the like such that the smoke producing end is positioned within the ashtray,

a shroud contacting the wall of the ashtray, said shroud including wall means extending above the ashtray and operative to confine within the shroud the smoke produced by the object positioned within the ashtray and including an aperture in the upper end thereof,

said shroud having an opening in the wall means thereof such that the shroud contacts only a portion of the wall of the ashtray such that the smoke producing object may be inserted through the opening to rest within the ashtray,

said opening defining spaced side walls of the shroud which are recessed back to expose a portion of the rim of the ashtray forward of said side walls,

housing means supported solely by said shroud,

said housing means having an opening generally vertically above the ashtray and said opening being in communication with said aperture,

said housing means including a discharge opening spaced from said opening of said housing means and cooperating with said opening in the wall means to form a passageway extending from outside and through said shroud to the outside environment,

power driven air moving means supported within said housing means and on said shroud and positioned over said opening in said housing means and within said passageway for drawing air through the opening in the wall means of said shroud and into said passageway for discharge through the opening in said housing means through the remainder of said passageway and through the discharge opening and into the environment, the movement of air through said shroud being operative to carry with it the smoke produced by said object within the confines of the shroud, and

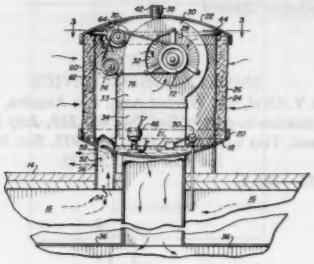
filter means supported between said shroud and said air moving means and within said passageway for filtering the air which is discharged from said shroud through said opening by the air moving means.

4,043,777

AIR HANDLING SYSTEM

Joseph R. Parren, 11212 N. 37th Drive, Phoenix, Ariz. 85029

Filed June 30, 1976, Ser. No. 701,281
Int. Cl.² F25D *23/12*; F28C *1/00*
U.S. Cl. 62—259 **3 Claims**



1. An air handling unit for cooling a building room and evacuating a dead air space located above the room, said air handling unit comprising:

a. a base member adapted for attachment to the roof of the building;

b. a top member and a bottom member vertically spaced apart, said bottom member defining a sump;

c. an evaporative cooling pad interposed between said top and bottom members and defining an enclosure;

d. means for supplying water from said sump to said pad;

e. first blower means within said enclosure having a discharge connected to a delivery duct communicating with said room;

f. exhaust duct means communicating with the atmosphere and said dead air space;

g. second blower means associated with said exhaust duct means for inducing a flow of air from said dead air space; and

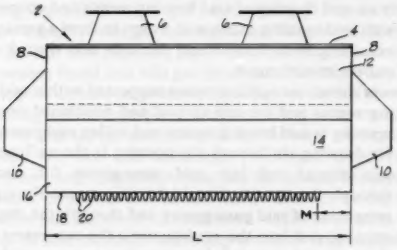
h. power transmission means drivingly connected to said first and second blower means.

4,043,778

ELECTRIC RESISTANCE BUSHING FOR MELTING INORGANIC MATERIALS

Walter William Harris, Toledo, Ohio, assignor to Johns-Manville Corporation, Denver, Colo.

Continuation of Ser. No. 587,505, June 16, 1975, abandoned. This application Oct. 5, 1976, Ser. No. 729,914
Int. Cl.² C03B *37/02*
U.S. Cl. 65—1 **15 Claims**



1. In a refractory metal bushing for melting inorganic materials by passing electrical current through said metal, said bushing having a top wall and a bottom wall, an inlet for the inorganic material and a plurality of orifices in said bottom wall for exuding molten inorganic material therethrough, said bushing being elongated with an end wall located on each end transverse to the elongation and terminal lug attached to each of said end walls, the improvement comprising:

a bushing having at least 40 orifices located sequentially along said elongation;

said bushing having

a. a length sufficient to provide at each end thereof a space between each end of the bushing and the center of the closest tip of at least about 0.75 inch, and

b. a width of at least 1.75 inches, and

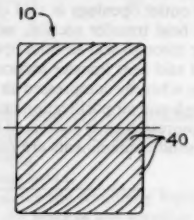
c. a height between the top wall and the bottom wall of the bushing of at least 3.5 inches.

4,043,779

APPARATUS FOR CHOPPING COATED GLASS FIBERS

William L. Schaefer, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 664,839, March 8, 1976, abandoned. This application Nov. 18, 1976, Ser. No. 742,807
Int. Cl.² C03B *37/02*
U.S. Cl. 65—2 **10 Claims**



1. In an apparatus for forming and chopping glass fiber strand comprising: a glass fiber forming bushing from which continuous filaments are drawn, means for applying a binder and/or size to said filaments, means for consolidating said filaments into one or more continuous glass fiber strands, a first wheel having a smooth flexible surface, a second wheel juxtaposed and contacting said first wheel at the circumferential surfaces thereof, said first wheel and said second wheel providing attenuate forces to said glass fiber strand or strands and the filaments associated therewith, a third wheel having positioned thereon a plurality of cutting edges mounted in a plurality of grooves provided on the periphery of said third wheel, means for rotating said first, second and third wheels and means for collecting the particular glass fiber bundles formed, the improvement wherein said second wheel has a plurality of grooves oblique to the rotational surface of said second wheel at an acute angle with respect to one sidewall of said second wheel and an obtuse angle with respect to the other sidewall of said second wheel, the sum of the acute and obtuse angles equaling about 180°, said grooves being of sufficient width and depth to continuously eject binder from the surface of said second wheel by centrifugal force upon rotation of said second wheel and said acute angle being sufficient to prevent vibrations of said apparatus.

4,043,780

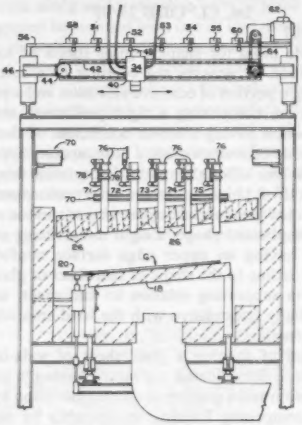
GLASS SHEET TEMPERATURE MONITORING SYSTEM

Jack A. Bricker, and John P. Durci, both of Tarentum, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 2, 1976, Ser. No. 692,156
Int. Cl.² C03B *29/04*
U.S. Cl. 65—29 **12 Claims**

1. A method of monitoring the temperatures of a series of glass sheets conveyed in a substantially horizontal path of travel through an elongated tunnel-type furnace enclosure formed by refractory walls wherein each of the glass sheets are oriented to provide a top major surface and a bottom major surface, comprising the steps of moving a pyrometer above the furnace into alignment with a first small, discrete opening in

the top refractory wall of the furnace, opening normally closed closure means for said first opening, measuring the temperature of a portion of a top major surface of a sheet of glass passing beneath said first opening within the furnace by means of said pyrometer, closing said closure means for said first opening, conveying said pyrometer in a direction substantially horizontal and transverse to the path of the glass sheets, stopping the pyrometer in alignment with a second small, discrete opening in the top refractory wall of the furnace, opening a normally closed closure means for said second opening, measuring the temperature of a portion of a top major surface of a glass sheet passing beneath said second opening within the furnace, closing said closure means for said second opening, and repeating said steps periodically so as to maintain a measurement of the temperature profile across the top surface of the series of glass sheets conveyed through the furnace.



8. Apparatus for heating a series of glass sheets and monitoring the temperature thereof comprising: a tunnel-type furnace enclosure formed by refractory walls, means for conveying glass sheets along a longtidinal path through the furnace with the glass sheets supported in a generally horizontal orientation, a plurality of small, discrete openings through the top refractory wall of the furnace spaced from each other in a direction generally transverse to the path of glass conveyance, a pyrometer mounted above the furnace, means for transversely moving the pyrometer into vertical alignment with each of said openings in sequence so that a temperature measurement of a sheet of glass may be made through each opening, closure means associated with each of said openings for covering each respective opening, and control means responsive to the location of the pyrometer for opening the respective closure when the pyrometer is aligned with each of the openings.

4,043,781

METHOD FOR MAKING A BROWN PHOTOCHROMIC GLASS

Clark V. DeMunn; David J. Kerko; Ralph A. Westwig, and David B. Wrisley, Jr., all of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 520,249, Nov. 11, 1974, abandoned. This application May 24, 1976, Ser. No. 689,202

Int. Cl.² C03C *15/00;* C03B *32/00;* C03C *3/04;* G02B *5/23*

U.S. Cl. 65—30 R **1 Claim**

1. A method for making a photochromic glass article having a brown coloration in the faded and darkened state which comprises

a. providing a potentially photochromic glass article having a composition consisting essentially, in weight percent, of about 53–60% SiO_2, 8–10% Al_2O_3, 15–18% B_2O_3, 1–3% Na_2O, 1.5–3.2% Li_2O, 5–9% BaO, 3.5–7% PbO, 0–4% ZrO_2, 0.012–0.040% CuO, 0.14–0.22% Ag, 0.22–0.36% Cl, 0.10–0.20% Br and 0–1% F;

b. heating the potentially photochromic glass article to a temperature in the temperature range of about 520°–580° C., and maintaining the article in that temperature range for a time of about 2–30 minutes;

c. further heating the potentially photochromic glass article to a temperature in the temperature range of about 600°–660° C. and maintaining the article in that temperature range for a time of about 5–60 minutes; and

d. cooling the article to room temperature; said brown coloration resulting from said method being present throughout the entire volume of said photochromic glass article.

4,043,782

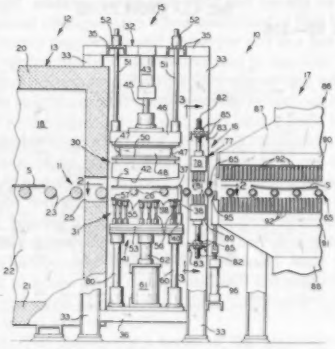
METHOD OF AND APPARATUS FOR BENDING RELATIVELY THIN GLASS SHEETS

Robert P. Bamford, deceased, late of Toledo, Ohio, by Penelope R. Bamford, executrix; Richard A. Herrington, Walbridge, and Waldemar W. Oelke, Rossford, both of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed June 23, 1975, Ser. No. 589,008

Int. Cl.² C03B *27/00*

U.S. Cl. 65—104 **8 Claims**



1. A method of bending and tempering relatively thin glass sheets comprising: heating a glass sheet to the softening point thereof in a furnace, transferring said heated sheet from said furnace onto a shaping surface of a press member, moving said press member toward a complemental shaping surface of a second press member to press said sheet therebetween and impart the desired curvature to said sheet, removing said sheet from between said press members and advancing said sheet to a primary tempering section immediately downstream from said press members, advancing said sheet through said primary tempering section while applying a cooling fluid at a rapid flow rate through a multiplicity of small diameter orifices under relatively high pressure but of relatively small volume against the opposite surfaces of said sheet to initiate tempering by creating a maximum temperature differential between the opposite surfaces of the glass sheet and the core thereof and maintaining said maximum temperature differential until said core of the sheet passes through the strain point of the glass, advancing said sheet from said primary tempering section to and through a secondary tempering section immediately downstream of said primary tempering section while applying a cooling fluid under relatively low pressure but of a relatively large volume against the opposite surfaces of said sheet to complete the tempering thereof.

4. Apparatus for bending and tempering relatively thin glass sheets comprising: a conveyor for supporting and moving a thin glass sheet along a substantially horizontal path through a heating chamber, a bending area, and a tempering area including a primary tempering section and a secondary tempering

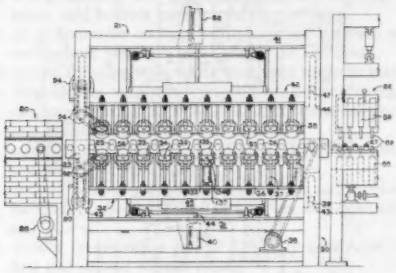
section; means in said heating chamber for heating the sheet to substantially the softening point of glass; opposed press members mounted in said bending area for press shaping said heated sheet into the desired curvature; said press members located immediately adjacent the exit end of said heating chamber in a substantially juxtaposed relation thereto; said primary tempering section being mounted immediately downstream of said press members in substantially juxtaposed relation thereto and including a multiplicity of relatively small diameter orifices for directing a plurality of streams of cooling fluid under relatively high pressure but of relatively small volume against the opposite surfaces of said bent sheet to initiate rapid chilling and tempering of the same while minimizing blow back into the bending area; said secondary tempering section located immediately downstream of said primary tempering section and including relatively large diameter orifices for directing a plurality of streams of cooling fluid under relatively low pressure but of relatively large volume against the opposite surfaces of said sheet to complete the tempering thereof.

4,043,783

PRESS SHAPING GLASS SHEETS

Robert G. Frank, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 5, 1976, Ser. No. 683,351
Int. Cl.[2] C03B *23/02*
U.S. Cl. 65—106 **15 Claims**



1. In the method of shaping glass sheets by the roll forming method wherein a series of hot glass sheets conveyed along rotating conveyor rolls is engaged and lifted above said conveyor rolls while moving between upper and lower sets of opposed rotating forming rolls having complementary shaping surfaces corresponding to the shape desired for each glass sheet in said series for sufficient time to impart a desired shape to each said glass sheet and then said glass sheet is disengaged from said upper set,

the improvement comprising lifting at least a portion of a preselected one of said rotating rolls into contact with a preselected portion of the lower surface of said glass sheet at a sufficient height above the level of the surface generated by the lower set of rotating forming rolls while the opposite portion of the upper surface of said glass sheet is disengaged, and continuing said lifting for sufficient time to modify the shape imparted to said preselected portion of said glass sheet by engagement between said upper and lower sets of opposed rotating forming rolls.

8. In apparatus for shaping glass sheets by the roll forming comprising a plurality of rotating conveyor rolls defining a path, upper and lower sets of opposed rotating forming rolls having complementary shaping surfaces corresponding to the shape desired for each glass sheet to be shaped, means for providing relative movement between said upper and lower sets to engage each glass sheet of a series of moving sheets in succession between said upper and lower sets of opposed rotating forming rolls and to separate said sets from one another, said conveyor rolls and said lower set of forming rolls disposed to face the lower surface of said glass sheets conveyed along said path, the improvement comprising means for automatically lifting at least a portion of a selected one of said so disposed rolls in response to preset timing means into a position slightly above the level of the surface generated by the lower set of opposed rotating forming rolls for sufficient time for said selected roll to contact a desired portion of the lower surface of said glass sheet for sufficient time to change the shape of said desired portion and for subsequently automatically lowering said selected roll to a position not higher than said level of said generated surface when said desired portion of said lower surface of said glass sheet passes over said selected roll.

4,043,784

SHAPING GLASS SHEETS

Thomas J. Reese, Sarver; Melvin W. Tobin, New Kensington, and James R. Mortimer, Natrona Heights, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 1, 1976, Ser. No. 701,465
Int. Cl.[2] C03B *23/02*
U.S. Cl. 65—107 **6 Claims**

1. A reusable mold for shaping glass sheets of soda-lime-silica composition by gravity sag bending to a complicated shape including a portion of concave elevation and a portion of convex elevation, comprising a rigid preformed sheet of a glassy composition having a lower coefficient of thermal expansion than soda-lime-silica glass, a heat capacity approximating that of soda-lime-silica glass and a deformation temperature at least 27° F. (15° C.) higher than the deformation temperature of soda-lime-silica glass and an upper major surface conforming to said complicated shape, a rigid metal frame of outline configuration having an upper edge surface conforming in elevation and outline to the shape of said sheet of glassy material disposed in supporting relation to said sheet, said sheet being substantially coextensive with the total area within said metal outline frame.

3. A method of shaping a glass sheet of soda-lime-silica composition to a complicated curvature having a portion of concave elevation and a portion of convex elevation by gravity sag bending comprising forming an assembly by supporting said soda-lime-silica sheet over a rigid preformed sheet of glassy composition having a lower coefficient of thermal expansion than said soda-lime-silica glass, a heat capacity approximating that of soda-lime-silica glass, a deformation temperature at least 27° F. (15° C.) higher than the deformation temperature of soda-lime-silica glass and an upper major surface conforming to said complicated shape and substantially coextensive with the area of said soda-lime-silica sheet, supporting said layer of glassy composition on a rigid metal frame of outline configuration having an upper edge surface conforming in elevation and outline to the shape of said rigid preformed sheet of glassy composition and a heat capacity per unit volume greater than that of said sheet of glassy composition, heating said assembly so formed to an elevated temperature at least equal to the deformation temperature of said soda-lime-silica glass sheet and below the deformation temperature of said sheet of glassy material until said soda-lime-silica sheet sags to conform to the complicated shape of said preformed sheet of said glassy composition, and cooling said assembly at a rate sufficiently rapid to impart a zone of compression stress around the marginal edge of said soda-lime-silica glass sheet and a zone of tension stress along a zone inward of said marginal edge approximately in alignment with said metal frame during said heating and cooling.

4,043,785

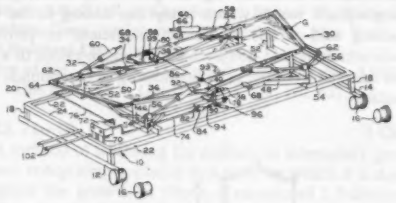
SHAPING GLASS SHEETS

Thomas J. Reese, Sarver, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 13, 1976, Ser. No. 714,067
Int. Cl.[2] C03B *23/02*
U.S. Cl. 65—107 **8 Claims**

1. Apparatus for shaping a flat glass sheet to a shape including a line of sharp curvature extending from one side edge to the other side edge of said sheet, said apparatus comprising an

outline mold of the skeleton type comprising an elongated metal rail disposed edgewise and having its upper edge forming a shaping surface conforming substantially to the shape desired for said glass sheet after bending, said rail including a pair of transversely spaced, longitudinally extending rail portions, each defining a generally V-shaped surface in elevation, the lowest portion of one of said V-shaped surfaces being aligned with the lowest portion of the other of said V-shaped surfaces along a transverse vertical plane of alignment, a first electrode located laterally outward of one side of said mold along said transverse plane of alignment and electrically insulated from said metal rail, a second electrode located laterally outward of the opposite side of said mold along said transverse plane of alignment, means adapted to couple said electrodes to a source of potential difference, a flexible electroconductive ribbon interconnected between said electrodes and extending therebetween along said transverse vertical plane of alignment, means disposed between at least one of said electrodes and said mold for engaging the undersurface of said ribbon and for urging said ribbon toward an upper position in said transverse vertical plane of alignment along a line below and adjacent to the plane occupied by the lower major surface of said flat glass sheet when the latter is mounted on said mold for bending, spacer means between the lower glass surface and said ribbon to limit said upper position to one spaced closely below said lower glass surface, said urging means providing an upward biasing force less than the mass of said glass sheet whereby said ribbon is urged to move to said upper position when a flat glass



sheet is mounted on said mold and said ribbon moves to a lower position below the lowest portion of said shaping surfaces when said glass sheet sags to conform to said shaping surface, and means to insulate said ribbon from said metal rail.

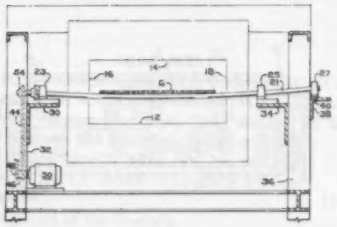
6. A method of shaping a flat glass sheet to a shape including a line of sharp bending extending completely across a dimension of said sheet comprising supporting said sheet over an outline shaping surface of a mold of the gravity sag type free of any overhead heating elements, applying spacing means to edge portions of the lower major surface of the sheet at opposite ends of the line of sharp bending, urging a ribbon of electroconductive material into close proximity to the lower major surface of said supported flat glass sheet along a line extending transversely of said supported sheet in a transverse vertical plane that intersects said line of sharp bending, heating said sheet over its entire area to a temperature approximating its deformation temperature, intensifying the heating of said ribbon when said sheet begins to sag, thereby intensifying the heating of said glass sheet along said transversely extending line of sharp bending and accelerating the sagging of said glass sheet along said transversely extending line, lowering said ribbon in closely spaced relation to said lower major surface as said glass sheet sags while maintaining an upward bias on said ribbon so that said ribbon contacts said spacing means and said spaced relation is maintained by said spacing means, discontinuing the intensified heating of said ribbon while continuing to heat said sheet over its entire area until the sagging of said glass sheet onto said outline shaping surface is completed.

4,043,786

GLASS SHEET CONVEYOR ROLLS AND PROCESS FOR CONVEYING THEREON

Dick T. Myers, Willard, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 7, 1976, Ser. No. 674,477
Int. Cl.[2] C03B *27/00, 25/04*
U.S. Cl. 65—114 **6 Claims**



1. Apparatus for conveying glass sheets through a path defined by aligned portions of a series of conveyor rolls spaced from one another along the length of a hot atmosphere comprising a rigid, unitary, metal conveyor roll having an essentially cylindrical configuration when unstressed, a first bearing housing rotatably supporting said conveyor roll in a horizontal plane near one longitudinal end thereof and to one side of said path, a second bearing housing rotatably supporting said conveyor roll in said horizontal plane near the other longitudinal end thereof to the other side of said path, and a third bearing housing rotatably supporting said conveyor roll slightly above said horizontal plane longitudinally outward of one of said other bearing housings, said third bearing housing supporting said conveyor roll at a level sufficiently higher than the first and second bearing housings that the roll is stressed to be bowed slightly downward in the portion thereof aligned with said path whereby said roll has less tendency than an unstressed roll to whip when rotated and said stressed roll supports said conveyed glass sheets substantially entirely along their longitudinal side end portions.

4. A method of conveying a series of flat glass sheets in a longitudinal direction through an elongated heated furnace comprising:

positioning each sheet on a plurality of longitudinally spaced, transversely extending conveyor rolls, maintaining said conveyor rolls stressed so as to bow slightly downward, rotating said conveyor rolls in unison so as to propel each glass sheet in the longitudinal direction while each sheet contacts the rolls along only longitudinal edge portions of each sheet during at least a portion of its passage through the furnace, heating each sheet while supported on said conveyor rolls to a temperature at which each sheet remains substantially flat so that contact between the rolls and center portions of each sheet is minimized, whereby optical distortion in the center portions of the sheets is reduced.

4,043,787

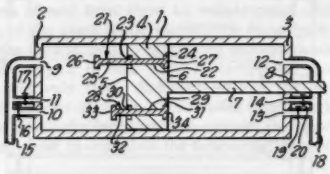
CYLINDER AND PISTON ASSEMBLIES IN GLASSWARE FORMING APPARATUS

Thomas Vincent Foster, Doncaster, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed June 15, 1976, Ser. No. 696,336
Claims priority, application United Kingdom, June 19, 1975, 26114/75
Int. Cl.[2] C03B *9/40*
U.S. Cl. 65—227 **12 Claims**

1. A glassware forming apparatus including a mechanism which is movable between first and second positions during the formation of glassware in the apparatus, and a cylinder and piston assembly for moving the mechanism between first and

second positions, the cylinder and piston assembly comprising a cylinder having opposed end walls, a piston slidably mounted in the cylinder for reciprocation between the end walls of the cylinder, at least three exhaust openings in each end wall of the cylinder, a plurality of members slidably carried by the piston, each one of said members cooperating with one associated exhaust opening in each of the opposed end walls of the cylinder, there being a greater number of exhaust openings in each end wall than there are slidable members, the slidable members



being of different lengths whereby, during reciprocation of the piston, the members are effective to produce a progressive cushioning effect by closure of corresponding exhaust openings when the piston reaches predetermined distances from the end of the piston stroke, each member closing a corresponding opening at a different predetermined distance, the members being slidably repositioned by contact with an end wall of the cylinder at the end of a piston stroke in one direction for effecting a progressive cushioning at the end of the piston stroke in the other direction.

4,043,788

CROP YIELD ADJUVANT

Lee Fryer, 11221 Markwood Drive, Silver Spring, Md. 20902

Filed Aug. 24, 1976, Ser. No. 717,276
Int. Cl.[2] C05B *15/00*
U.S. Cl. 71—29 **7 Claims**

1. A new composition of matter consisting of fish, hydrolysed with potassium hydroxide, neutralized with phosphoric acid, and augmented with urea to provide the major plant nutrients in the ratio of 2 parts nitrogen to 1 part P_2O_5 and 1 part K_2O, seaweed hydrolysates prepared by the action of Lactobacilli on seaweed and by the chemical hydrolysis of seaweed, and a source of chelated plant micronutrients for application to crop plants to enhance their yields.

4,043,789

PROCESS FOR MANUFACTURING OF PHOSPHORIC ACID

Rolf Steen Hansen; Ole Hannibal Lie; Henning Reier Nilsen, and Thor Sandal, all of Porsgrunn, Norway, assignors to Norsk Hydro a.s, Oslo, Norway

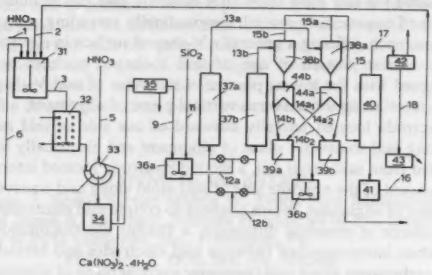
Filed Mar. 19, 1975, Ser. No. 560,089
Claims priority, application Norway, Mar. 19, 1974, 740983
Int. Cl.[2] C05B *7/00, 11/06;* C01B *25/32*
U.S. Cl. 71—34 **10 Claims**

1. In a process for the production of phosphoric acid containing calcium phosphates, i.e. Ca-containing phosphoric acid, by evaporating Ca-containing mother liquor from the Odda process and thereby removing substantially all remaining nitrate and fluorine in the form of HNO_3, HF and SiF_4, the improvement comprising:

maintaining the Ca/P weight ratio of said Ca-containing mother liquor below 0.45;

recycling and adding Ca-containing phosphoric acid to said Ca-containing mother liquor to form a liquid mixture which is evaporated; and

controlling the recycling of said Ca-containing phosphoric acid to maintain a liquid mixture phosphorus concentration during evaporation outside a concentration range of from approximately 15% by weight to approximately



22% by weight, thereby preventing said liquid mixture from becoming pasty.

4,043,790

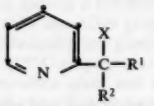
METHOD OF REGULATING THE GROWTH OF AQUATIC WEEDS WITH PYRIDINE DERIVATIVES

Eriks V. Krumkalns, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 2, 1976, Ser. No. 673,031
Int. Cl.[2] A01N *9/22*
U.S. Cl. 71—66 **10 Claims**

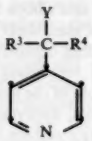
1. A method for inhibiting the growth of submerged and floating aquatic weeds which comprises adding to the water containing said weeds an amount sufficient to provide a growth-inhibiting and non-herbicidal concentration of a compound selected from the group consisting of compounds of the formulae:

(I)



and

(II)



wherein

X is hydrogen or hydroxyl:

R^1 is hydrogen, C_1–C_7 alkyl, C_3–C_6 cycloalkyl, cyclohexylmethyl, phenyl, or monohalophenyl;

R^2 is C_1–C_7 alkyl, cyclohexyl, phenyl, C_1–C_4 alkoxyphenyl, monohalophenyl, cyclohexylmethyl, trifluoromethylphenyl, phenoxybutyl, or 3,4-dimethylcyclohexyl;

R^1 and R^2, when taken together with the carbon atom to which they are attached, form 9-fluorenyl;

Y is hydrogen, hydroxyl or methoxy;

R^3 is hydrogen, cyclohexyl, phenyl, monohalophenyl, C_1–C_7 alkyl, or cyclohexylmethyl;

R^4 is C_1–C_7 alkyl, cyclohexyl, cyclohexylmethyl, monohalophenyl, phenoxybutyl, or methoxyphenyl;

R^3 and R^4, when taken together with the carbon atom to which they are attached, form 9-fluorenyl; and

the nonphytotoxic acid addition salts thereof.

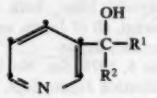
4,043,791

METHOD OF REGULATING THE GROWTH OF AQUATIC WEEDS WITH PYRIDINE DERIVATIVES

Eriks V. Krumkalns, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 2, 1976, Ser. No. 673,040
Int. Cl.[2] A01N 9/22
U.S. Cl. 71—66 4 Claims

1. A method for inhibiting the growth of submerged and floating aquatic weeds which comprises adding to the water containing said weeds an amount sufficient to provide a growth inhibiting and non-herbicidal concentration of a compound of the formula



wherein

R^1 is C_1–C_6 alkyl, phenyl, or C_3–C_8 cycloalkyl;

R^2 is trifluoromethoxyphenyl, 1,1,2,2-tetrafluoroethoxyphenyl, pentafluoroethoxyphenyl, or 3,4-(difluoromethylenedioxy)phenyl; and

the nonphytotoxic acid addition salts thereof.

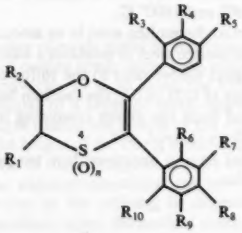
4,043,792

PLANT GROWTH REGULATION USING CERTAIN SUBSTITUTED 2,3-DIHYDRO-1,4-OXATHIINS

Bruce A. Graham; Michael A. Puttock, both of Guelph; Ethel E. Felauer, Arkell, all of Canada, and Robert W. Neidermyer, Cheshire, Conn., assignors to Uniroyal, Inc., New York, N.Y. and Uniroyal Ltd., Canada

Division of Ser. No. 459,442, April 9, 1974, Pat. No. 3,947,264.
This application Oct. 30, 1975, Ser. No. 627,177
Int. Cl.[2] A01N 5/00
U.S. Cl. 71—78 7 Claims

1. A method of inhibiting the axillary or intercalary growth of plants comprising applying to a locus at which it is desired to regulate the growth of plants, a substituted 2,3-dihydro-1, 4-oxathiin chemical of the formula



wherein the R's having the following values:

R_1 = H

R_2 = H, CH_3 or C_2H_5

R_3 = H, Cl or CH_3

R_4 = H, Cl or CH_3

R_5 = H, Cl, F, CH_3,

or SCH_3

R_6 = H, Cl or CH_3

R_7 = H, Cl, CH_3 or OCH_3

R_8 = H, Cl, Br, F, CH_3, C_2H_5, OCH_3 or NH_2

R_9 = H or CH_3

R_{10} = H

and n is zero, 1 or 2, the said plant growth regulant effect being a non-herbicidal plant growth regulant effect and the said chemical being applied in non-herbicidal amount sufficient to produce the said non-herbicidal axillary or intercalary plant growth inhibiting effect.

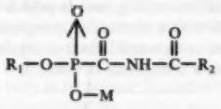
4,043,793

N-PHOSPHONOCARBONYL CARBAMIC ACID DERIVATIVES AS PLANT GROWTH REGULANTS

Richard Frank Sauers, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 21, 1976, Ser. No. 688,929
Int. Cl.[2] A01N 9/36; C07F 9/40
U.S. Cl. 71—86 15 Claims

1. A compound of the formula



where

M is sodium, lithium, potassium, or ammonium;

R_1 is methyl or ethyl; and

R_2 is methyl, ethyl, methoxy, or ethoxy, said methyl or ethyl groups optionally substituted with 1 to 3 chlorine atoms.

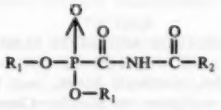
4,043,794

N-PHOSPHONOCARBONYL CARBAMIC ACID DERIVATIVES AS PLANT GROWTH REGULANTS

Richard Frank Sauers, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 21, 1976, Ser. No. 688,930
Int. Cl.[2] A01N 9/36; C07F 9/40
U.S. Cl. 71—86 4 Claims

1. A method for retarding the growth of plants which comprises applying a growth regulating amount of a compound of the formula:



where

R_1 is methyl or ethyl; and

R_2 is methyl, ethyl, methoxy, or ethoxy, said methyl or ethyl groups optionally substituted with 1 to 3 chlorine atoms.

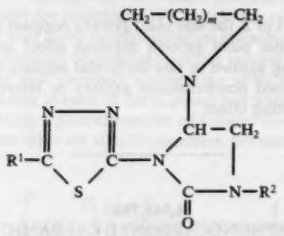
4,043,795

THIADIAZOLYL AND CYCLOIMINO IMIDAZOLIDINONES

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Mar. 10, 1976, Ser. No. 665,466
Int. Cl.[2] C07D 417/14
U.S. Cl. 71—90 10 Claims

1. A compound of the formula



wherein R^1 is selected from the group consisting of lower alkyl, cycloalkyl of from 3 to 7 carbon atoms, lower alkenyl, lower chloroalkyl, lower bromoalkyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl and lower alkylsulfinyl; R^2 is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl and propargyl; and *m* is an integer from 0 to 4.

10. A method of controlling weeds which comprises contacting said weeds with a herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of claim **1.**

4,043,796

SELECTIVE HERBICIDAL COMPOSITIONS

Daniel Hainaut, Villemomble; Jean-Pierre Demoute, Montreuil-sous-Bois, and Andre Teche, Nanterre, all of France, assignors to Roussel Uclaf, Paris, France

Filed Feb. 17, 1976, Ser. No. 658,331

Claims priority, application France, Feb. 18, 1975, 75.04978; Nov. 28, 1975, 75.36459

Int. Cl.² A01N *9/12;* **C07C** *119/00*

U.S. Cl. 71—98 **8 Claims**

1. A method of selectively killing weeds in cereal crops comprising applying to cereal crops an herbicidally effective amount of a compound selected from the group consisting of N-methyl-N-isopropylthio-N′-phenyl-urea, N-methyl-N-(2-chloroethylthio)-N′-(3,4-dichlorophenyl)-urea, N-methyl-N-n-butylthio-N′-(4-isopropylphenyl)-urea, N-methyl-N-isopropylthio-N′-(4-isopropylphenyl)-urea, N-methyl-N-isopropylthio-N′-(3,4-dimethylphenyl)-urea and N-methyl-N-n-butylthio-N′-(3,4-dimethylphenyl)-urea and an inert carrier.

8. N-methyl-N-(2-chloroethylthio)-N′-(3,4-dichlorophenyl)-urea.

4,043,797

SULFIDE HERBICIDE ANTIDOTE COMPOSITIONS AND METHOD OF USE

Duane R. Arneklev, Antelope, Mont., and Don R. Baker, Orinda, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 394,230, Sept. 4, 1973, abandoned. This application June 27, 1975, Ser. No. 591,238

Int. Cl.² A01N *9/12*

U.S. Cl. 71—98 **6 Claims**

1. The method of protecting a crop from injury due to a thiocarbamate herbicide, comprising applying to the habitat prior to planting from about 0.01 to about 15 parts by weight for each part by weight of the thiocarbamate herbicide an antidote compound corresponding to the formula

$$R_1—S—R_2$$

wherein R_1 is selected from the group consisting of di-p-chlorophenylmethyl, pentachlorophenyl, mono-chlorobenzamido-ethyl, dichlorobenzamidoethyl, and mono-bromobenzamido-ethyl; and R_2 is selected from the group consisting of p-chlorophenyl, haloalkyl having from 1 to 4 carbon atoms, mono-chlorobenzamido-ethyl, dichlorobenzamidoethyl, and mono-bromobenzamidoethyl.

4,043,798

PROCESS FOR PRODUCING STEEL HAVING IMPROVED LOW TEMPERATURE IMPACT CHARACTERISTICS

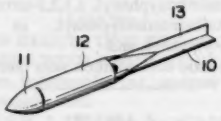
Hajime Nashiwa; Akiyoshi Mori, both of Wakayama, and Makoto Tokuda, Ibaragi, all of Japan, assignors to Sumitomo Metal Industries Limited, Japan

Filed June 6, 1975, Ser. No. 584,501

Claims priority, application Japan, Sept. 20, 1974, 49-109339; Oct. 24, 1974, 49-122927; Nov. 7, 1974, 49-129421

Int. Cl.² C21C *7/00, 7/10*

U.S. Cl. 75—53 **23 Claims**



1. A process for producing steel having improved low temperature impact characteristics comprising the steps of

forming a molten steel having the following quantities of elements present therein as expressed in weight percent unless otherwise specified:

Carbon	0.02 to 0.55
Silicon	Less than 0.50
Manganese	0.20 to 2.50
Sulfur	Less than 0.01
Oxygen	Less than 100 ppm

maintaining the molten steel at a temperature in the range between 1480° and 1800° C,

adding calcium to the molten steel in an amount of 0.1 to 2.0 kg per ton of molten steel to establish a calcium content in the molten steel whose ratio to the sulfur content therein is in the range of 0.05 to 0.8, the calcium being added in a form selected from the group consisting of metallic calcium and alloys thereof, and

recovering steel having improved low temperature impact characteristics.

4,043,799

METHOD AND DEVICE FOR BLOWING OXYGEN IN METAL REFINING CONVERTERS IN UNSTATIONARY MANNER

Giovanni Maria Carlomagno, and Bruno Costa, both of Naples, Italy, assignors to Italsider S.p.A., Genoa, Italy

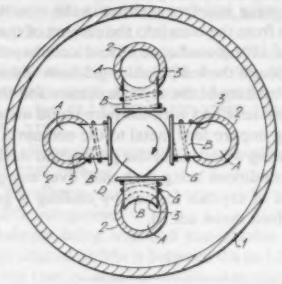
Continuation-in-part of Ser. No. 590,227, June 25, 1975, which is a continuation of Ser. No. 391,382, Aug. 24, 1973, abandoned. This application July 29, 1976, Ser. No. 709,755

Int. Cl.² C21C *5/30*

U.S. Cl. 75—60 **12 Claims**

1. In a steel refining process in which jets or oxygen are

blown onto the surface of the material in a converter, the step of positively inducing variations of the delivery of oxygen



from the jets during at least a part of an oxygen blowing period to vary penetration of the jets into materials in the converter.

4,043,800

METHOD FOR MONITORING AND CONTROLLING THE REFINING OF CRUDE IRON

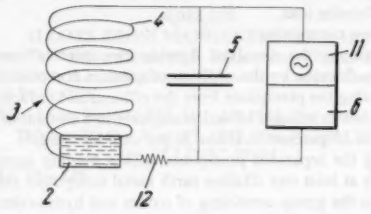
Gustav Mahn, Wolfenbuttel; Josef Schoop, Peine, and Jorg Kügler, Wolfenbuttel, all of Germany, assignors to Stahlwerke Peine-Salzgitter AG, Peine, Germany

Filed Oct. 24, 1974, Ser. No. 517,811

Claims priority, application Germany, Oct. 27, 1973, 2354003

Int. Cl.[2] C21C 5/30

U.S. Cl. 75—60 **7 Claims**



1. In the refining of crude metal by blowing an oxygen-comprising gas into a molten crude metal bath contained within the interior of a converter so as to cause the formation atop the molten crude metal of a layer of metal-slag emulsion which increases in height during the course of the refining, a method of measuring the height of the rising metal-slag emulsion layer during the course of the refining, so as to be able to control the blowing of the oxygen-comprising gas into the metal bath during the course of the refining in dependence upon the height of the emulsion layer, the method comprising arranging at least one reactive circuit component outside of the boundary surface of the interior of the converter so that the reactive circuit component cannot physically contact the molten crude metal in the interior of the converter, with the reactive circuit component extending up along the height of the converter and the interior of the converter also constituting the interior of the reactive circuit component, the metal-slag emulsion layer atop the metal bath in the interior of the converter and accordingly in the interior of the reactive circuit component constituting a part of the reactive circuit component, with the height of the metal-slag emulsion layer within the interior of the reactive circuit component determining the reactance of the reactive circuit component; connecting the at least one reactive circuit component to at least one further circuit component to form a resonant electricl circuit the resonance of which is dependent upon the reactance of the reactive circuit component and accordingly upon the height of the metal-slag emulsion layer within the interior of the reactive circuit component; and indirectly measuring the height of the emulsion layer by measuring the effect of the height of the layer of metal-slag emulsion upon the resonance of the resonant electrical circuit.

4,043,801

METHOD OF SIMULTANEOUSLY CONTROLLING TEMPERATURE AND CARBON CONTENT OF MOLTEN STEEL AT THE END-POINT IN OXYGEN TOP-BLOWN CONVERTER

Eiichi Sakamoto, Kamakura; Masanobu Kubo, Yokohama; Takashi Yasui, Kamakura; Katsuya Suzuki, Yokohama, and Katsuhiko Tachibana, Kamakura, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 420,470, Nov. 30, 1973, abandoned. This application July 25, 1975, Ser. No. 598,756

Claims priority, application Japan, Dec. 11, 1972, 47-123417

Int. Cl.[2] C21C 5/30

U.S. Cl. 75—60 **6 Claims**

1. A method of controlling the temperature and carbon content of a molten steel bath at the end-point in an oxygen top-blown converter comprising the steps of:

determining the temperature of the molten steel at the end point as a function of at least the material balance and heat balance, and then assembling raw materials including molten pig iron, carbon monoxide and oxygen, for the molten steel bath in such quantity and relative proportions that the temperature of the molten steel bath at the end-point attains a temperature higher than a target temperature at the end-point;

blowing oxygen to the converter in an amount sufficient to attain a predetermined bath carbon content which is a function of the desired carbon content of the end product steel to be produced;

simultaneously measuring the temperature and carbon content of the molten steel by a single sensor upon completing the blowing of oxygen;

operating on said measured temperature and carbon content and determining a "forecast heating factor" in accordance with the following:

$$A' = \alpha_o + \alpha_1 E_o + \alpha_2 E_B + \alpha_3 E_{EA} + \alpha_4 E_L + \alpha_5 \Delta W_C + \alpha_6 \Delta W_{FE}$$

where

A' = forecast heating factor (Ton.°C/Nm^3 of oxygen);

E_O = calories possessed by initial charge (K cal);

E_B = calories possessed by the charge at the time of measuring (K cal);

E_{EA} = target calories possessed by the charge at the end point (K cal);

E_L = loss calories between measurement and end-point (K cal);

ΔW_C = amount of decarburization (Ton);

ΔW_{Fe} = amount of oxidized molten iron (Ton); and

α_o, α_1, α_2, α_3, α_4, α_5 and α_6 are constants

operating on said measured temperature and carbon content and determining decarburization parameters as follows:

V = decarburization rate during the maximum decarburization period (KgC/Nm^3 of oxygen);

C_P = curve parameter(%); and

C_D = carbon content at critical decarburization (%);

further blowing in oxygen in a quantity derived from said forecast heating factor A' for raising the temperature of the molten steel bath up to a previously estimated temperature value after the measuring, the quantity of oxygen being further blown in being defined in accordance with the following:

$$\Delta Q = (W_T \cdot \Delta T)/A'$$

where

ΔQ = the quantity of oxygen further blown in for raising the temperature up to the estimated temperature value after the measuring (Nm^3);

W_T = weight of total charge (Ton) at the time of the further blowing operation; and

ΔT = temperature rise after measuring (° C) at the time of the further blowing operation;

determining the carbon content at the end-point of the process as a function of said oxygen quantity after the measuring and said decarburization parameters in accordance with the following:

$$C_{EC} = C_O + C_P \ln[1 + \left\{ \exp\left(\frac{C_B - C_O}{C_P}\right) - 1 \right\} \cdot \exp\left\{ -\frac{100V - \Delta Q}{W_{ST} - C_P} \right\}]$$

where

C_{EC} = calculated carbon content at the end-point (%);

C_O, C_P, V = decarburization parameters;

ΔQ = the quantity of oxygen blown in for raising the temperature up to an estimated level after the measuring (Nm^3); and

C_B = carbon content at the time of measuring (%); and

carrying out at least one of the following: (i) still further blowing in a given quantity of oxygen ΔQ_c at the end-point, (ii) supplying a requisite amount of coolant W_{Cp} and (iii) soft blowing in accordance with a given pattern of soft-blow, the given quantity of oxygen, the requisite amount of cooling and the soft-blow pattern being a function of the difference between said calculated carbon content at the end-point of the process and said target carbon content at the end-point, to simultaneously control the temperature and carbon content of said molten steel at the end-point of the process.

4,043,802

CONTINUOUS REFLUX REFINING OF METALS

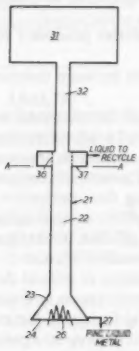
James Durie Esdaile, Glen Waverley, and Graeme William Walters, Mount Waverley, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Sept. 25, 1975, Ser. No. 616,816

Claims priority, application Australia, Sept. 30, 1974, 9067/74

Int. Cl.[2] C22B *7/00*

U.S. Cl. 75—63 **18 Claims**



1. A method for the continuous purification of an impure metal which is hypoeutectic with respect to the pure metal sought, said method comprising providing a column consisting of a slurry of metal crystals in liquid metal, said column having a relatively cool zone and a relatively hot zone at which almost all of the heat input into the column is supplied, and a continuous temperature gradient between said zones; the temperature of the cool zone being such as to permit coexistence of liquid and crystalline metal, and said hot zone being at a temperature sufficient to melt the crystals; chilling a portion of the column in the said cool zone to form a coherent mass of crystals of the metal then allowing incipient melting in the mass to occur to release crystals from the mass into the column of the crystals in the liquid metal in the cool zone of said column; transporting the crystals through the temperature gradient and into the hot zone, wherein melting of the crystals occurs and the hot zone thereby becomes enriched with the pure liquid metal; continuously supplying impure feed metal to the column and continuously withdrawing a portion of the pure liquid metal from the hot zone; the conditions being such that, over any given interval, the weight of crystals formed by chilling is greater than the weight of feed metal added.

4,043,803

PROCESS FOR THE MANUFACTURE OF A COMPACTED SYNTHETIC FLUX BASED ON CALCIUM FLUORIDE

Arankathu Skaria, Stafe, and Reiner Stark, Fallanden, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Mar. 11, 1975, Ser. No. 557,370

Claims priority, application Switzerland, Mar. 15, 1974, 3612/74

Int. Cl.[2] C22B *9/10*; C01D *3/02*

U.S. Cl. 75—257 **18 Claims**

1. A process for producing a compacted, calcium fluoride based, synthetic flux from an aqueous effluent containing dissolved fluoride ions,

the steps comprising:

precipitating the dissolved fluorine ions essentially as calcium fluoride by the addition of calcium compounds;

separating the precipitate from the effluent and reducing the free water content of said precipitate to a content of from about 10 percent to about 30 per cent by weight;

mixing the separated precipitate with a binding agent and with at least one alkaline earth metal compound selected from the group consisting of oxides and hydroxides;

compacting said mixture; and

subsequently drying the compacted mixture.

4,043,804

RECOVERY OF METAL VALUES FROM COPPER REVERBERATORY SLAG

Kenneth O. Lindblad, Anaconda, Mont., assignor to The Anaconda Company, New York, N.Y.

Filed June 16, 1976, Ser. No. 696,728

Int. Cl.[2] C22B *15/00*

U.S. Cl. 75—117 **9 Claims**

1. A process for the recovery of metals from copper reverberatory slag containing iron in the form of silicates comprising:

forming a substantially homogeneous mixture of iron sulfate and slag having from greater than about one to about five parts by weight slag per part iron sulfate,

roasting said mixture in an oxidizing atmosphere at a temperature of at least about 550° C. for a time sufficient to effect decomposition of substantially all of the iron sulfate to iron oxide and the copper values to water soluble copper salts, and

separating the water soluble copper salts from the iron oxide and silica.

4,043,805

ISOTROPIC AND HIGH-STRENGTH HIGH SILICON STEEL SHEET

Satohiro Hayami; Jun Imamura; Hiroshi Hayakawa, and Tadatzugu Yabuta, all of Yokohama, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 477,098, June 6, 1974, abandoned. This application Nov. 17, 1975, Ser. No. 632,692
Claims priority, application Japan, June 11, 1973, 48-65538
Int. Cl.[2] C22C *33/00*; H01F *1/04*
U.S. Cl. 75—123 L 7 Claims

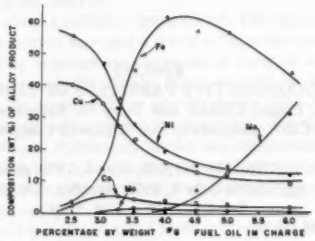
1. A high silicon steel composition consisting essentially of
0.03 to 0..15% carbon,
0.7 to 2.3% silicon,
0.7 to 2.0% manganese,
with the balance being iron and unavoidable impurities and wherein the ratio of Si/Mn is between 0.6 to 1.5 and the sulfur content is less than or equal to 0.02% as an unavoidable impurity, said composition being in the form of a rolled sheet having high ductility and thoughness in all directions independent of the rolling direction, said sheet having a total elongation measured in any direction of not less than 41%, a reduction of area measured in any direction of not less than 81%, and a tensile strength measured in any direction of not less than 50 kg/mm^2, and an n value of not less than 0.27, and wherein for a given sheet, each of said properties is substantially the same regardless of in which direction the property is measured.

4,043,806

ALLOYS FROM MANGANESE NODULES

Thomas C. Wilder, Cambridge, Mass., and Walter E. Galin, Pawtucket, R.I., assignors to Kennecott Copper Corporation, New York, N.Y.

Division of Ser. No. 514,614, Oct. 15, 1974, Pat. No. 3,957,485. This application Nov. 17, 1975, Ser. No. 632,477
Int. Cl.[2] C22C *39/54*
U.S. Cl. 75—125 8 Claims



1. An alloy composed of several immiscible phases, a major phase being an iron-rich nickel phase, one minor phase containing 80–90% copper and another minor phase being a combination of manganese, molybdenum, nickel, cobalt and iron, the overall composition of the alloy having the following constituents in percent by weight:

Copper	22.9 %
Nickel	27.7 %
Cobalt	4.25 %
Molybdenum	1.23 %
Iron	44.3 %
Manganese	Balance

4,043,807

ALLOY STEELS

Ivor Kirman, Birmingham, England, assignor to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 420,112, Jan. 2, 1974, abandoned. This application Feb. 10, 1976, Ser. No. 656,984
Int. Cl.[2] C22C *38/04, 38/12, 38/16*
U.S. Cl. 75—125 7 Claims

1. A low alloy, high strength steel characterized by good toughness, weldability and cold formability and consisting of from about 0.01 to 0.09% carbon, about 0.4% to about 0.8% nickel, about 0.7% to about 1.1% copper, about 0.2 to about 0.1% niobium, about 1.1% to about 1.65% manganese, aluminum present up to 0.08%, up to 0.5% each of chromium and molybdenum, up to about 0.6% silicon, up to about 0.01% boron, up to about 0.1% of at least one metal selected from the group consisting of zirconium, magnesium, calcium, and rare earths, the balance being essentially iron, said steel being further characterized in that the carbon equivalent expressed by the formula:

$$C + \frac{Mn}{6} + \frac{Cr + Mo}{5} + \frac{Ni + Cu}{15}$$

is not more than 0.41, said steel being further characterized in that the strength level is at least about 450 MN/m^2 and the 70J longitudinal impact transition temperature is below about −10° C. over section thickness of at least 15 to 35 mm notwithstanding that the steel was finished hot rolled at a temperature up to 1050° C.

4,043,808

STEEL ALLOY

Thomas Watmough, Dolton, and Robert P. O'Shea, Lombard, both of Ill., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 14, 1972, Ser. No. 282,082
Int. Cl.[2] C22C *38/02, 38/04, 38/24*
U.S. Cl. 75—126 E 3 Claims

1. A fragmentation type steel alloy consisting essentially of by weight about 0.029 to 0.082 percent phosphorus; about 0.5 percent carbon; about 1.5 percent manganese; about 1.5 percent chromium; about 0.15 percent vanadium; about 0.4 percent silicon; and the balance substantially all iron.

4,043,809

HIGH TEMPERATURE SUPERCONDUCTORS AND METHOD

John J. Ruvalds, 245 Colonnade Drive, Apt. 11, Charlottesville, Va. 22901

Filed May 24, 1976, Ser. No. 689,252
Int. Cl.[2] C22C *19/03, 30/02*
U.S. Cl. 75—134 N 12 Claims

1. A superconductive compound having the formula:

$$Ni_{1-x}M_xZ_y$$

wherein M is a metal which will destroy the magnetic character of nickel; Z is hydrogen or deuterium; x is 0.1 to 0.9; and y, correspondingly 0.9 to 0.1.

2. A superconductive compound having the formula:

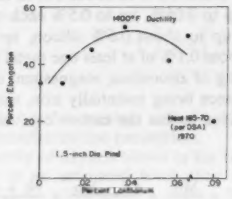
$$Ni_{1-x}M_xZ_y$$

wherein M is a metal selected from copper, silver, gold or mixtures thereof; Z is hydrogen or deuterium; x is 0.1 to 0.9; and y, correspondingly, 0.9 to 0.1.

4,043,810
CAST THERMALLY STABLE HIGH TEMPERATURE NICKEL-BASE ALLOYS AND CASTING MADE THEREFROM

Dennis A. Acuncius; Robert B. Herchenroeder, both of Kokomo; Russell W. Kirchner, Greentown, and William L. Silence, Kokomo, all of Ind., assignors to Cabot Corporation, Kokomo, Ind.

Continuation-in-part of Ser. No. 179,922, Sept. 13, 1971. This application Dec. 29, 1975, Ser. No. 644,430
Int. Cl.[2] C22C *19/05*
U.S. Cl. 75—171 6 Claims



1. A cast thermally stable high temperature alloy characterized by superior oxidation resistance, sustainable high hot strength and retention of ductility on aging consisting essentially by weight of:

Mo: 13.7% to 15.5%
Cr: 14.7% to 16.5%
C: Up to 0.1%
La: An effective amount to produce oxidation resistance up to 0.08%
B: Up to 0.015%
Mn: 0.3% to 1.0%
Si: 0.2% to 0.75%
Co: Up to 2.0%
Fe: Up to 3.0%
W: Up to 1.0%
Cu: Up to 0.35%
P: Up to 0.02%
S: Up to 0.015%
Al: 0.1% to 0.5%
Ni: Balance

said alloy having an Nv number less than 2.31.

4,043,811
CONVERSION SOLUTIONS FOR PLANOGRAPHIC MASTERS

Richard John Pratt, Solon, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed July 29, 1976, Ser. No. 709,667
Int. Cl.[2] G03G *13/28*
U.S. Cl. 96—1 R 12 Claims

1. A conversion solution for treating an imaged electrostatic planographic master comprising a photoconductive material carried in a resinous binder to convert the non-image hydrophobic portions of said master to a condition of hydrophilicity comprising an aqueous solution of potassium ferrocyanide, a mineral acid, a buffering salt selected from the group consisting of monobasic ammonium phosphate and monobasic sodium phosphate to mantain the PH in the range from about 4.0 to about 5.0 and a solubilizing amine present in an amount from 1.0 - 6.0 weight percent having the formula:

$$R\,R'\,N - C_nH_{2n} - O - X$$

wherein R and R′ are the same or different alkyl or hydroxy alkyl or amine alkyl substituents or hydrogen, X is hydrogen, lower alkyl or lower hydroxy alkyl and *n* is an integer from 2 to 4, inclusive.

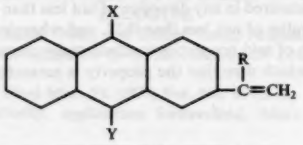
4,043,812
ELECTROSTATOGRAPHIC IMAGING MEMBER AND PROCESS USING ANTHRACENE FUNCTIONAL POLYMERS

Milan Stolka, Fairport; James M. Pearson, Webster, and John F. Yanus, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 445,705, Feb. 25, 1974, Pat. No. 3,923,762, which is a continuation-in-part of Ser. No. 417,317, Nov. 19, 1973, abandoned. This application Mar. 7, 1975, Ser. No. 556,256
Int. Cl.[2] G03G *5/04*
U.S. Cl. 96—1.5 6 Claims

1. In an electrophotographic imaging member comprising a conductive substrate, a photoconductive layer covering at least one surface of said substrate and a charge carrier transport matrix layer overcoating the photoconductive layer, the improvement comprising

a charge carrier transport matrix layer comprising an anthracene functional polymer having polymer segments which consist essentially of the addition product of at least one monomer of the formula



wherein R is hydrogen or alkyl of 1 to about 3 carbon atoms; and X and Y are independently selected from chlorine, bromine, alkyl of 1 - 4 carbon atoms, or phenyl

said polymer segments having a degree of polymerization of about 40 or greater, aid transport layer having a thickness of from about 0.1 to about 300 microns.

4,043,813
PHOTOCONDUCTIVE PARTICLES OF ZINC OXIDE

Daniel R. Logue, Upland, and Terry G. Anderson, Pasadena, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Continuation of Ser. No. 367,668, June 6, 1973, abandoned. This application July 7, 1975, Ser. No. 594,150
Int. Cl.[2] G03G *5/08, 5/04*
U.S. Cl. 96—1.8 2 Claims

1. An improved photoconductive material having a surface coating comprising zinc oxide particles, sensitizer compound and an insulative binder, said sensitizer compound comprising a compound selected from the group consisting of cadmium selenide, cadmium telluride, zinc selenide, zinc telluride, mercuric selenide and mercuric telluride, said sensitizer compound being present in a concentration of at least about 0.5% and not in excess of about 10% by weight of the total concentration of zinc oxide plus sensitizer compound as a surface deposit on and strongly adhered to the surface of said zinc oxide particles in the form of substantially discontinuous islands on each said particle, said islands having an average thickness of between about 100 and 500 Angstroms, whereby said layer has increased light sensitivity, resists shifts in spectral response during reuse, and has a bi-chargeability.

4,043,814

IMAGE INTENSIFICATION

Isao Shimamura, and Koichi Nakamura, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 6, 1975, Ser. No. 629,444

Claims priority, application Japan, Nov. 6, 1974, 49-128327; Dec. 4, 1974, 49-139917

Int. Cl.[2] G03C *7/00, 5/24, 5/32*

U.S. Cl. 96—10 24 Claims

1. In an image-forming method which comprises contacting with an intensifying agent in the presence of a reducing agent, a photographic element comprising a support having thereon at least one layer containing image-wise distributed catalyst nuclei and thereby image-wise oxidizing the reducing agent and conducting image intensification, the improvement comprising using chlorite, chlorous acid, an aqueous solution of chlorine dioxide having a pH of 8 to 13, bromite or bromous acid as said intensifying agent.

4,043,815

METHOD OF MAKING PRINTING PLATES FOR OFFSET PRINTING

Stephane Klymus, 19 rue Gagner, Ivry-sur-Seine, val de Marne, France

Continuation of Ser. No. 592,521, July 2, 1975, abandoned, which is a continuation of Ser. No. 373,602, June 25, 1973, abandoned. This application Aug. 18, 1976, Ser. No. 715,384

Claims priority, application France, June 28, 1972, 72.23365

Int. Cl.[2] G03F *7/02*

U.S. Cl. 96—33 3 Claims

1. A method of making a printing plate for offset printing, comprising the steps of:

a. providing a positive transparency having a transparent non-sensitive base and a sensitive layer thereon;

b. printing a design on the sensitive layer of said positive transparency, the design when viewed by an observer from the sensitive layer side appearing right-reading;

c. mounting said positive transparency on a support provided with registration marks, said design carrying layer of the positive transparency being outward toward the observer on said mounting so that the design is rightreading for analysis;

d. contact printing a proof from said positive transparency for analysis of the mounted transparency and indicating connections on said proof;

e. using the indicated proof for correcting errors in the mounted transparency;

f. providing a negative transparency having a transparent non-sensitive base and a sensitive layer thereon;

g. contact-printing from said positive transparency a negative of the design on the sensitive layer of the negative transparency, said design appearing as a mirror image by an observer who looks at the sensitive layer said thereof;

h. providing a printing plate having a sensitive layer; and

i. reproducing the design of the negative transparency onto the printing plate by placing the design carrying layer of the negative transparency against the sensitive layer of said printing plate.

4,043,816

PHOTOGRAPHIC PROCESS FOR MAKING DIAZOTYPE COPIES UTILIZING SMALL QUANTITY OF LIQUID DEVELOPER

Johannes P. Bomers, Grubbenvorst, and Gerardus J. Vosbeek, Velden, both of Netherlands, assignors to Oce-van der Grinten N.V., Venlo, Netherlands

Continuation-in-part of Ser. No. 363,659, May 24, 1973, abandoned. This application Oct. 24, 1974, Ser. No. 517,527

Claims priority, application Netherlands, May 26, 1972, 7207099

Int. Cl.[2] G03C *1/58, 5/34*

U.S. Cl. 96—49 8 Claims

1. Process for making diazotype copies which comprises imagewise exposing a diazotype material comprising a support and a light-sensitive surface layer, said surface layer having an average thickness of not more than 8 micrometers and comprising between 0.2 and 2 millimoles per square meter of one or more diazo compounds which, in vitro, couple more actively than 4-diazo-2-chloro-N.N.-diethylaniline, and thereafter applying to said light-sensitive surface layer a quantity of between 1.5 and 4.5 cm^3 per square meter of a buffered aqueous developing solution which is at a pH of between 5.5 and 7 and which contains, per liter, 0.1–0.6 g. mol of azo-coupling component consisting of at least 50% by weight of phloroglucinol and 1–3 g. equivalents of buffer salt, thereby obtaining a copy that immediately feels dry and exhibits an azo-dyestuff image in the unexposed areas of said diazotype material.

4,043,817

METHOD OF FORMING PHOTOGRAPHIC IMAGES FOR LITHOGRAPHIC USE

Eiichi Okutsu; Katsumi Hayashi; Shigenori Moriuchi, and Takeo Sakai, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 7, 1975, Ser. No. 629,826

Claims priority, application Japan, Nov. 7, 1974, 49-128769

Int. Cl.[2] E03C *5/30, 1/76*

U.S. Cl. 96—66 R 6 Claims

1. A continuous method for producing halftone images comprising:

1. image-wise exposing a lith-type silver halide photographic material comprising a silver halide emulsion with not less than about 85 mol% silver chloride and not more than about 8 mol% silver iodide and containing at least one organic silver complex compound which is substantially insoluble in water and has a maximum solubility of not more than 10^{-4} mol per liter in contiguous relationship with a photosensitive silver chlorobromide or chlorobromoiodide emulsion which contains not less than 60 mol% silver chloride and which is chemically and spectrally sensitized, a photographic speed of the silver halide emulsion containing the silver complex compound being about 1/5 to about 1/100 that of the silver chlorobromide or chlorobromoiodide emulsion, and

2. developing said photographic material in a continuous fashion with a developer containing hydroquinone and a carbonyl bisulfite adduct in the presence of a polyalkylene oxide of a molecular weight not less than 1000.

4,043,818

PROCESS FOR HARDENING PHOTOGRAPHIC LAYERS WITH CARBODIIMIDE COMPOUNDS CONTAINING SULPHOBETAINE GROUPS

Wolfgang Himmelmann, Opladen; Erwin Ranz, Leverkusen, and Edy Roche, Cologne, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Aug. 12, 1975, Ser. No. 604,015

Claims priority, application Germany, Aug. 17, 1974, 2439553

Int. Cl.[2] G03C *1/40, 1/30*

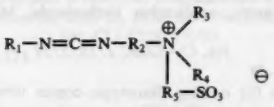
U.S. Cl. 96—77 9 Claims

1. The method of hardening a light sensitive photographic

material comprising a silver halide emulsion layer and containing at least one supported layer containing protein

by contacting the protein-containing layer with an effective amount of a hardener to harden the layer

wherein the improvement comprises the hardener is an asymmetric carbodiimide compound of the following formula:



in which

R_1 = alkyl with from 1 to 6 carbon atoms or cycloalkyl or alkoxy alkyl;

R_2 = alkylene with from 2 to 4 carbon atoms;

R_3 = alkyl with from 1 to 3 carbon atoms;

R_4 = alkyl with from 1 to 3 carbon atoms or phenyl, or R_3 and R_4 together represent the atoms required to complete a 6-membered heterocyclic ring which, in addition to the N-atom, may also contain nitrogen or oxygen; and

R_5 = alkylene with from 1 to 4 carbon atoms.

4,043,819

PHOTO-POLYMERIZABLE MATERIAL FOR THE PREPARATION OF STABLE POLYMERIC IMAGES AND PROCESS FOR MAKING THEM BY PHOTOPOLYMERIZATION IN A MATRIX

Niklaus Baumann, Marly, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 584,444, June 6, 1975, abandoned. This application Nov. 18, 1976, Ser. No. 743,011

Claims priority, application Switzerland, June 11, 1974, 7956/74; June 11, 1974, 7957/74; Apr. 16, 1975, 4843/75

Int. Cl.[2] **G03C** *1/68;* **C08F** *2/46*

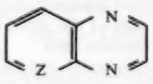
U.S. Cl. 96—115 P **69 Claims**

1. Photo-polymerisable material, suitable for the preparation of stable polymeric images, characterised in that it contains, on a carrier, at least one layer composed of

1. ethylenically unsaturated monomers which are soluble in water or water-alcohol mixtures and which contain one or more terminal double bonds and at least one polar atom grouping with a lone electron pair,

2. as the photo-initiator which, conjointly with the monomer (1) and/or the binder (3a), forms a photo-redox pair, a compound having a ring system of the formula

(1)



wherein Z is a nitrogen atom or the group C-R, R is hydrogen or a substituent and the compound is optionally quaternised, and

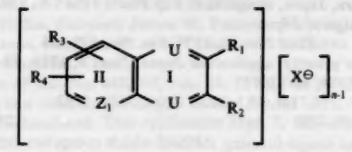
3. as a matrix for the monomer (1), a swellable reaction product of at least one

a. macromolecular binder which is soluble in water or water-alcohol mixtures and which has at least one polar atom grouping containing a lone electron pair, with

b. a hardener, the hardener being different from the monomers of the component (1), and optionally

4. a chemically inert macromolecular compound which does not react with the binder (a) or the hardener (b).

8. Photo-polymerisable material according to claim **1,** characterised in that the photo-initiator is a diazine compound of the formula



wherein n is 1 or 2, Z_1 denotes a nitrogen atom or a group

one U denotes a nitrogen atom and if n is 1, the other U also denotes a nitrogen atom, and if n is 2 denotes a group of the composition

X denotes an anion, Y denotes an alkyl radical which is optionally substituted further, R_1 and R_2 independently of one another denote a hydrogen atom or an alkyl, alkoxy, aroyl, aryloxy or aralkoxy radical which is optionally substituted further, or R_1 and R_2, conjointly with two carbon atoms of the ring I, denote a heterocyclic or isocyclic ring, and R_3, R_4 and R_5 independently of one another denote a hydrogen atom, an alkyl, alkoxy, aryloxy or aralkoxy radical which is optionally substituted further, a halogen atom, a nitro group, a cyano group, a hydroxyl group, an amino group which is optionally substituted further, an alkylammonium group, a carboxylic acid group, a carboxylic acid amide group, a carboxylic acid alkyl ester group or a sulphonic acid group or two of R_3, R_4 and R_5, conjointly with two adjacent carbon atoms of the ring II, denote an isocyclic or heterocyclic ring.

39. Process for recording information, in particular for preparing stable polymeric images, by photo-polymerisation in a matrix, characterised in that the photo-polymerisable material according to claim **1** is exposed image-wise and subsequently treated with a solvent, which dissolves the components (1) and optionally (2), but which does not dissolve the polymer formed from (1) by exposure and the hardened product from the components (*3a*) and (*3b*) which was formed in the manufacture of the photo-polymerisable material, and the solvent is then removed by drying.

41. Photopolymerisable material, suitable for the preparation of stable polymeric images, containing on a carrier at least one layer composed of at least one ethylenically unsaturated, photopolymerisable monomer and at least one photo-initiator, characterised in that the monomer is present in a matrix of a swellable reaction product from a chemically hardenable, non-light-sensitive, swellable macromolecular compound and a hardener, and optionally a macromolecular compound which is chemically inert towards the chemically hardenable compound and the hardener.

64. Photocurable material according to claim **41,** characterised in that ethylenically unsaturated photopolymerisable compounds are used which are soluble in lower alcohols with 1 to 4 carbon atoms and/or in water.

4,043,820
INK CONTAINING IRON CHELATE AND POLYHYDROXY COMPOUND

Raphael Landau, Woodford Green, England, assignor to Ozalid Group Holdings, Limited, England

Filed June 10, 1975, Ser. No. 585,754
Int. Cl.² C09D *11/00*
U.S. Cl. 106—21 **7 Claims**

1. An ink, capable of producing a visible trace having a high absorption for light, said ink being an aqueous solution containing a dissolved chelate of iron, said chelate being selected from the group consisting of the ferric sodium salt of ethylenediamine tetraacetic acid and ferric ammonium oxalate, and a dissolved water soluble polyhydroxy compound which is selected from the group consisting of tannic acid, pyrocatechol, pyrogallol and gallic acid, water soluble derivatives of said tannic acid, said pyrocatechol, said pyrogallol and said gallic acid, ascorbic acid and chromotropic acid sodium salt, the ink being sufficiently acid to prevent reaction between the chelate and the polyhydroxy compound until the ink is applied to an alkaline surface, and containing at least 5% by weight of said chelate and at least 5% by weight of said polyhydroxy compound.

4,043,821
VITROCERAMIC MATERIALS AND PROCESS OF MAKING THE SAME

Eugene Le Bras, Franconville-La Garenne, France, assignor to Compagnie Internationale de Minerallurgie - CIM, Neuilly-sur-Seine, France

Filed July 28, 1976, Ser. No. 709,430
Claims priority, application France, June 28, 1975, 75.23428
Int. Cl.² C03C *3/22*
U.S. Cl. 106—39.6 **7 Claims**

1. A vitroceramic product containing at least 90% by weight of the sum of the following ingredients expressed in percent by weight of the sum thereof:

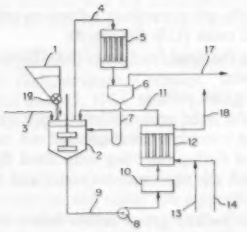
$SiO_2 + Al_2O_3 + B_2O_3$	40–50%
Iron oxides (expressed in the form of ferric iron oxide - Fe_2O_3)	16–30%
CaO + MgO (wherein MgO may be 0%),	24–40%

the sum of $Al_2O_3 + B_2O_3$ being 2–15%; said product including at least 0.5% by weight of a nucleus forming agent.

4,043,822
TREATMENT OF WATER-SOLUBLE METAL SULFATE RESIDUES

Bela I. Karsay, DeWitt, and Robert L. Sturtevant, Baldwinsville, both of N.Y., assignors to Allied Chemical Corporation, Morristown, N.J.

Filed Nov. 20, 1975, Ser. No. 633,775
Int. Cl.² C04B *33/04*; C01B *17/50, 17/72, 17/90*
U.S. Cl. 106—70 **9 Claims**



1. Process for transforming solid watersoluble metal sulfate residue obtained from spent sulfuric acid into a substantially water-insoluble agglomerated reduction product, which comprises introducing said metal sulfate residue into a pool of molten sulfur maintained at temperature of at least about 250° C, wherein said pool of molten sulfur furnishes both the reaction medium as well as the reductant for said metal sulfate residue, to thereby generate a gaseous stream comprising sulfur dioxide and to transform the metal sulfate residue into a corresponding reduction product, recovering sulfur dioxide and separating reduction product from the pool of molten sulfur to recover agglomerated reduction product containing sufficient elemental sulfur to bind together the reduction product.

4,043,823
LIGHTWEIGHT SILICON OXYNITRIDE

Malcolm E. Washburn, Princeton, and Stephen D. Hartline, Shrewsbury, both of Mass., assignors to Norton Company, Worcester, Mass.

Filed July 21, 1975, Ser. No. 597,821
Int. Cl.² C04B *35/48*
U.S. Cl. 106—40 R **7 Claims**

1. An insulating refractory body consisting essentially of Si_2ON_2, having less than 30% of SiO_2 and less than 15% Si_3N_4, said body having a density less than 50% of theoretical, at least 50% of the void volume of said body comprising spherical voids, said body being free of interparticular pores, as distinguished from matrix pores, and having a crush strength in excess of 500 p.s.i. and a thermal conductivity of less than 20 BTU inch/hr./ft.²/°F. at 1170° F.

4,043,824
CERAMIC COLOR COMPOSITIONS AND A METHOD FOR DECORATING CERAMIC WARE THEREWITH

Nelson William Wagar, Pittsburgh, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 4, 1975, Ser. No. 601,738
Int. Cl.² C03C *5/02*
U.S. Cl. 106—48 **4 Claims**

1. A ceramic color composition comprising an intimate dispersion of from about 1 to about 6 parts of a ceramic pigment or a glass color in 1 part of a moisture or steam settable, liquid vehicle consisting essentially of a solution of at least one water-insoluble film-forming resin in a water-miscible solvent therefor, said vehicle being volatilizable without leaving objectionable residue thereof at a temperature below the decomposition temperature of the ceramic pigment and below the fusion temperature of the glass color, and the amount of resin in said vehicle ranging from about 15 to about 60% of the weight of said vehicle and being such that when the composition is applied to non-glazed ceramic ware and exposed to moisture or steam, a film of the resin is precipitated from the solvent onto the ware.

4,043,825
PRODUCTION OF FOAMED GYPSUM MOLDINGS

Martin Müller, Krefeld; Friedrich Hinsche, Leverkusen; Gerhard Winter, Krefeld, and Karl Brändle, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 14, 1975, Ser. No. 604,868
Claims priority, application Germany, Sept. 3, 1974, 2442098
Int. Cl.² C04B *11/00*
U.S. Cl. 106—87 **9 Claims**

1. In the production of a gypsum-based porous body of high strength by foaming a gypsum-water mixture containing alkali, hydrogen peroxide and a decomposition catalyst therefor, the improvement which comprises including in said mixture an acid reacting compound with active hydrogen atoms in a quantity sufficient to bring the final pH of the mixture to about 12 to 12.5, said acid reactimg compound being an acid, an ammonium salt or a salt of a metal of the first or second Main Group of the Periodic System.

4,043,826

PROCESS FOR MAKING ARTIFICIAL ROCKS

Bing W. Hum, 5227 Palco Place, College Park, Md. 20740

Filed Nov. 22, 1974, Ser. No. 526,404
Int. Cl.[2] C04B *7/35*
U.S. Cl. 106—90 17 Claims

1. A process for making light-weight simulated rock structures comprising molding an artificial rock molding composition comprising cement, a light-weight filler, water, a curing agent for the cement, and an acrylic resin latex paint in a mold having a nonuniform, grainy-textured molding surface to form a hardened rock body exhibiting a grainy surface resembling the surface of natural rock, said grainy surface defining cracks, indentations and concavities therein, removing the hardened rock body from the mold, applying to at least a portion of the grainy surface of the hardened rock body a coating of a cement colorant, and thereafter removing a portion of the coating of said cement colorant nonuniformly such that cement colorant preferentially resides in said cracks, identations and concavities, whereby a light-weight nonuniformly colored simulated rock structure is produced.

4,043,827

SAG-RESISTANT DRY-SET MORTAR COMPOSITION

Frank E. Bernett, Yardley, Pa., assignor to Tile Council of America, Inc., Princeton, N.J.

Continuation of Ser. No. 412,152, Nov. 2, 1973, abandoned. This application Oct. 24, 1975, Ser. No. 625,749
Int. Cl.[2] C04B *7/352*
U.S. Cl. 106—92 19 Claims

1. In a dry-set Portland cement mortar composition consisting essentially of, in the dry state, Portland cement and sand present in amounts sufficient to form a conventional mortar composition, and a minor amount of a water-soluble cellulose ether, the improvement consisting of the inclusion in the composition of from 0.5 to 3.0 percent by weight of an additive selected from the group consisting of montmorillonite clays and attapulgite clays, and mixtures thereof.

4,043,828

SHRINKAGE INHIBITION OF CEMENTITIOUS SYSTEMS THROUGH THE ADDITION OF SPECIALLY PROCESSED CARBONACEOUS MATERIALS

Robert W. Gaines, Darien, Conn., assignor to Construction Products Research, Inc., Old Greenwich, Conn.

Continuation-in-part of Ser. No. 560,686, March 21, 1975, abandoned. This application Aug. 23, 1976, Ser. No. 716,435
Int. Cl.[2] C04B *7/02*
U.S. Cl. 106—97 15 Claims

1. A method for inhibiting the shrinkage of an aqueous hydraulic cementitious system prior to hardening comprising selecting a particulate carbonaceous material from the group consisting of delayed coke and naturally occurring coal, treating the material by heating it to a temperature substantially in excess of that temperature at which moisture is driven out of the material, incorporating the treated particulate carbonaceous material in the cementitious system, in an amount effective to counteract the shrinkage tendency of the cementitious system, the carbonaceous material being one which when so treated is effective to inhibit shrinkage by causing expansion of the system compared to no incorporation of carbonaceous material.

4,043,829

STABILIZED WAX EMULSIONS

Edward L. Ratledge, Claymont Heights, Del., and Richard E. Ware, Aston, Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 175,380, Aug. 26, 1971, abandoned, which is a division of Ser. No. 744,705, July 15, 1968, Pat. No. 3,819,530. This application Oct. 31, 1975, Ser. No. 627,731
Int. Cl.[2] C08L *91/06*
U.S. Cl. 106—271 17 Claims

1. A wax-in-water emulsion composition consisting of a wax, an emulsifier, and 2.0 to 5.0 weight percent based on the weight of the whole composition of a stabilizing additive of the structural formula:

wherein Q is a substitutent selected from the group consisting of $-NH_2$, $-NHCH_3$ and $-NHC_2H_5$ and Q′ is a substitutent selected from the group consisting of $-NHCH_3$ and $-NHC_2H_5$.

4,043,830

METHOD OF CONSOLIDATING POOR QUALITY SOILS

Manao Suzuki, Tokyo, Japan, assignor to Kyokado Engineering Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1975, Ser. No. 618,773
Int. Cl.[2] C09K *3/00;* E02D *3/12*
U.S. Cl. 106—287 SS 6 Claims

1. In a method of consolidating a poor quality soil by injecting hardeners thereinto, in which a mixture of water and a gelling agent and a water glass aqueous solution containing a gelling agent are employed as the hardeners, the improvement comprising the steps of

joining the hardeners together to form a resultant liquid,

injecting the resultant liquid obtained by joining the hardeners into the soil, and

during the injection, suspending the joining operation of the mixture of the water and gelling agent and only continuously injecting the water glass aqueous solution containing gelling agent into the soil.

4,043,831

DENSIFICATION OF COAL FLY ASH

Louis D. Friedman, New Brunswick, N.J., assignor to Cogas Development Co., Princeton, N.J.

Filed July 7, 1975, Ser. No. 593,921
Int. Cl.[2] C04B *31/00*
U.S. Cl. 106—288 B 6 Claims

1. A method of producing densified fly ash pellets having a specific gravity of about 2.0 to 2.3 consisting essentially of the steps

a. sizing the fly ash to produce a fraction substantially finer than −200 mesh (U.S. Standard);

b. moistening the sized fraction with sufficient water to form green pellets;

c. sizing the green pellets;

d. tumbling the sized green pellets to effect particle packing until excess water has been squeezed out, said pellets being kept dusted during tumbling with sized fly ash from step (a) to absorb the squeezed out water and thereby prevent agglomeration;

e. drying the packed green pellets below about 300° F to remove the free water therefrom;

f. heating the dried pellets from about 1000° F to about 70–90% of the absolute softening temperature of the ash until the iron oxides are converted substantially to the

$\alpha-Fe_2O_3$ form of hematite and carbon is burned off to a residual value of no more than about 3 to 5% and;

g. sintering the treated, dried pellets of step (f) at a temperature of 70 to 90% of the absolute softening temperature of the ash.

4,043,832

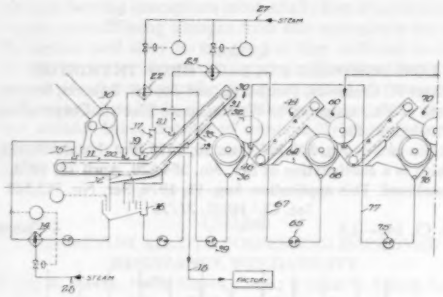
APPARATUS FOR EXTRACTING SUBSTANCES FROM FIBROUS MATERIALS

Wilhelm J. Leibig, Aurora; Clarence R. Steele, and Frank B. Price, both of Denver, all of Colo., assignors to CF&I Engineers, Inc., Denver, Colo.

Continuation of Ser. No. 232,690, March 8, 1972, abandoned, which is a continuation of Ser. No. 54,370, July 30, 1970, abandoned. This application Apr. 5, 1976, Ser. No. 673,676

Int. Cl.[2] C13D *1/04;* **B30B** *3/04, 9/20*

U.S. Cl. 127—6 **20 Claims**



1. In an apparatus for extracting soluble substances from sugar cane, the combination comprising:

means for fiberizing the sugar cane so as to substantially expose the cane juice,

means for collecting the fiberized mass of cane,

a first compressing means for expressing liquid contained in said fiberized mass,

said compressing means having opposed upper and lower compression surfaces,

said lower compression surface provided with openings therein for conducting a substantial portion of the expressed liquid therethrough during the compressing operation,

means for macerating the fiberized mass prior to said first compressing means,

means for supplying said maceration means with liquid expressed from said first compressing means, and

means for removing liquid from said maceration means for supply to the final product.

4,043,833

METHOD OF AND DEVICE FOR CLEANING THE SLOT-LIKE OPENINGS OF DISTRIBUTION AND COLLECTION PIPES IN AN ION EXCHANGER COLUMN

Georg Plura, Bergnestadt, Germany, assignor to L. & C. Steinmuller GmbH, Gummersbach, Germany

Filed Jan. 21, 1976, Ser. No. 650,898

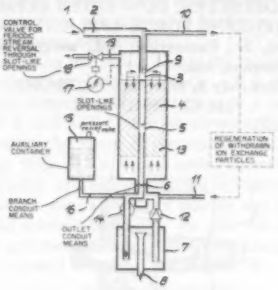
Claims priority, application Germany, Jan. 23, 1975, 2502607

Int. Cl.[2] B08B *3/00*

U.S. Cl. 134—34 **4 Claims**

1. A method of cleaning the periodically blocked slot-like openings of distribution and collection pipes of a continuously operating ion exchange column in which the ion exchange particles during the treatment phase of a medium stream conveyed to an ion exchange bed in said column do not change places, and in which said bed during said treatment phase carries out an axial movement without temporal interruption, which includes the steps of continuing to convey said medium stream into said column, and through said bed and through slot-like openings to an outlet conduit, and when the throughflow per time unit decreases, applying fluid under pressure from an external source to said outlet conduit and openings to create flow under pressure opposed to said medium stream and subjecting said medium stream to periodic short time flow reversals to shock clean said slot-like openings while releasing the pressure of said medium stream on said bed in said column, during said subjecting said medium stream to periodic short time flow reversals the ion exchange particles being not subject to any space change during the flow reversal within the ion exchanger bed.

2. In combination: a housing adapted to receive an ion exchange bed, inlet conduit means leading into the upper portion of said housing and provided with first opening means for conveying an untreated medium stream into a section of an ion exchange bed inserted in said housing, outlet conduit means provided with slot-like opening means for receiving from said bed treated medium stream, a storage container, first conduit means including a shut-off valve interposed therein and leading



from said outlet conduit means to said storage container, second conduit means leading from said storage container into said housing and including a pump interposed in said second conduit means, said storage container also having an outlet adapted selectively to be opened and closed, a closed auxiliary container having a gaseous atmosphere therein, branch conduit means branching off from said outlet conduit means upstream of said shut-off valve and also leading into said auxiliary container for conveying medium from said outlet conduit means into said auxiliary container and compressing said gaseous atmosphere therein, and control means including a control valve communicating with the interior of the upper portion of said housing above a bed in said housing and adapted when open to vent said medium from said housing, said control means also including gauge means operatively connected with said control valve to cause said control valve to open in response to pressure in said upper portion of said housing above a set pressure, thereby controlling brief reversal of medium stream flowing through said slot-like openings to shock clean said slot-like openings.

4,043,834

FLEXIBLE SOLAR GENERATOR PANEL

Dieter Rusch, Wedel, Holstein, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Germany

Filed Sept. 7, 1976, Ser. No. 720,653

Claims priority, application Germany, Sept. 18, 1975, 2541536

Int. Cl.[2] H01L *31/04*

U.S. Cl. 136—89 SA **6 Claims**

1. A solar generator for satellite and terrestrial energy supply systems, comprising a flexible support, a plurality of solar cells mounted on said support and being rollable and foldable therewith, connector means electrically interconnecting said

cells, and at least one conducting layer adapted to be grounded to the associated satellite or to the earth and applied to said

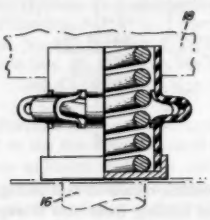
support on the side opposite said cells for elimination of charge carriers.

4,043,835

FLEXIBLE SLEEVE THERMAL PATH DEVICE FOR THERMOELECTRIC CONVERTER ELEMENT PRESSURE LOADING FORCE APPLICATION SPRING

Samuel D. Hall, Jr., Catonsville, Md., assignor to Teledyne Isotopes, Timonium, Md.

Filed July 9, 1975, Ser. No. 594,449
Int. Cl.[2] H01L *35/02*
U.S. Cl. 136—221 **4 Claims**



1. A device for augmenting transfer of heat between a thermoelectric element cold end and a heat rejection system around a thermoelectric force application spring comprising:

a thermally conductive flexible sleeve for surrounding the force application spring with a highly conductive heat transfer path between the thermoelectric element and the heat rejection system, said sleeve comprising a cylindrical slotted tube comprising a plurality of layers of foil bonded together at the ends thereof and having a plurality of collapsible flat strips defined between longitudinal slits in the side walls of said cylindrical tube, which collapsing strips bow outwardly of the tube when an axial compressive force is applied to the ends of said tube to allow the sleeve to be longitudinally collapsible and to decrease the axial length thereof without interfering with the application of force by the force application spring; and

an end cap on said sleeve assembly located adjacent to and electrically insulated from said thermoelectric cold end.

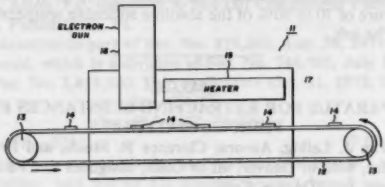
4,043,836

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

Yen Sheng Edmund Sun, Liverpool, N.Y., assignor to General Electric Company, Auburn, N.Y.

Filed May 3, 1976, Ser. No. 682,581
Int. Cl.[2] H01L *21/263*
U.S. Cl. 148—1.5 **5 Claims**

1. A method of adjusting the electrical characteristics of a semiconductor device comprising forming deep level recombination centers by subjecting the monocrystalline semiconductor material of said device at a temperature in the range of about 150° to 375° C to impact by crystal lattice-damaging



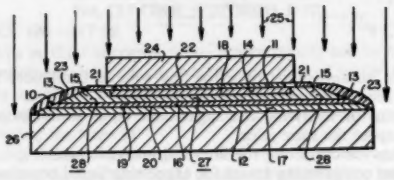
electrons (with irradiation) of an energy level in excess of about 250 Kev.

4,043,837

LOW FORWARD VOLTAGE DROP THYRISTOR

Michael W. Cresswell, Pittsburgh, and John S. Roberts, Export, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 540,208, Jan. 10, 1975, Pat. No. 3,990,091, which is a continuation of Ser. No. 354,620, April 25, 1973, abandoned. This application Aug. 11, 1976, Ser. No. 713,568
Int. Cl.[2] H01L *21/26*
U.S. Cl. 148—1.5 **4 Claims**



1. A method of making a thyristor comprising the steps of:

a. diffusing impurities into a semiconductor body to form a cathode-base region therein having an impurity concentration at the working point of less than 5×10^{15} per cm^3;

b. masking against radiation from a radiation source conducting portions of the thyristor; and

c. thereafter irradiating unmasked portions of the semiconductor device with the radiation source to increase gate current to fire the thyristor.

4,043,838

METHOD OF PRODUCING PITTING RESISTANT, HOT-WORKABLE AUSTENITIC STAINLESS STEEL

Harry E. Deverell, Natrona Heights, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 571,460, April 25, 1975, Pat. No. 4,007,038. This application Oct. 7, 1976, Ser. No. 730,400
Int. Cl.[2] C21D *7/13*
U.S. Cl. 148—2 **4 Claims**

1. A method for producing an austenitic stainless steel alloy consisting essentially of about 20% to 40% nickel, 14% to 21% chromium, about 6% to 12% molybdenum, 0.010% to 0.20% cerium, 0.005% to 0.050% calcium and the remainder substantially all iron, which comprises melting said alloy and casting it into a shape which can be rolled, and thereafter hot rolling said shape with a finishing temperature after rolling about or greater than 1800° F.

4,043,839

INTERNAL NITRIDATION OF COBALT-BASE SUPERALLOYS

Albert G. Hartline, III, and Lynn E. Kindlimann, both of Woodland Hills, Calif., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 565,189, April 3, 1975, abandoned. This application May 24, 1976, Ser. No. 689,402

Int. Cl.[2] C21D *1/56*

U.S. Cl. 148—20.3 **13 Claims**

1. A method of strengthening cobalt-base superalloys by internal nitridation of substantially the entire volume of said alloys, which comprises the steps of: heating a cobalt-base alloy containing at least 33% cobalt as the major constituent, chromium, up to 25% nickel, up to 0.15% carbon, from 1 to 3% of nitride forming elements from the group consisting of titanium, vanadium, niobium, and tantalum, balance residuals and those elements which enhance the properties of cobalt-base alloys, at a temperature of from 1600° to 2500° F in a nitrogen-bearing atmosphere substantially free of moisture and oxygen, and diffusing nitrogen from said atmosphere into and throughout said alloy for a period of time sufficient to form nitrides having an interparticle spacing of less than 10 microns, said nitrides being from the group consisting of titanium nitride, vanadium nitride, niobium nitride and tantalum nitride, said nitrides being distributed substantially throughout said nitrided alloy; said cobalt base alloy being less than 25 mils thick.

4,043,840

ALUMINUM ALLOYS POSSESSING IMPROVED RESISTANCE WELDABILITY

Philip R. Sperry, North Haven, Conn.; William C. Setzer, Creve Coeur, Mo., and Lloyd E. Damon, Wallingford, Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed July 9, 1976, Ser. No. 703,781

Int. Cl.[2] C22C *21/06*

U.S. Cl. 148—32 **18 Claims**

1. A wrought article exhibiting reduced electrical conductivity, increased electrical resistivity, improved resistance weldability plus good tensile properties prepared from an aluminum base alloy consisting essentially of from 2.0 to 6.0% magnesium, up to 0.40% iron, up to 0.40% silicon, and from 0.03 to 0.20% vanadium, balance aluminum, wherein vanadium is retained in solid solution.

4,043,841

METAL-REFRACTORY COMPOSITE MATERIAL

Hervé Bibring, Meudon; Jean-Pierre Trottier, Bagneux; Tasadduq Khan, Plessis-Robinson; Maurice Rabinovitch, Chatillon, and Jean-François Stohr, Bourg-la-Reine, all of France, assignors to O.N.E.R.A. - Office National d'Etudes et de Recherches Aerospatiales, Chatillon, France

Filed Aug. 27, 1975, Ser. No. 608,346

Claims priority, application France, Sept. 13, 1974, 74.31140

Int. Cl.[2] C22C *19/05*

U.S. Cl. 148—32.5 **8 Claims**

1. A refractory composite material adapted to be used particularly in the manufacture of aviation turbine blades, comprising a nickel-based superalloy matrix consisting essentially of nickel, cobalt, aluminum, in the form of Ni_3Al precipitate, and 7 to 10% by weight tungsten; and a reinforcing phase of oriented monocrystalline niobium carbide fibers formed in situ during production of the material by unidirectional solidification, said composite material having a density of less than 9 and a composition by weight of:

Co — 20 to 30%
Cr — 6 to 15%
W — 7 to 10%
Al — 3 to 6%
Nb — 4 to 6%
C — 0.4 to 0.65%
Ni — balance to 100.

4,043,842

GRINDING MEMBERS

Victor L. J. Joiret, 115, rue de la Beole, Chaudfontaine, Belgium

Continuation of Ser. No. 271,027, July 12, 1972, abandoned, which is a continuation-in-part of Ser. No. 32,802, April 29, 1970, abandoned, which is a continuation-in-part of Ser. No. 696,325, Jan. 8, 1968, abandoned, said Ser. No. 271,027, is a continuation-in-part of Ser. No. 178,822, Sept. 8, 1971, abandoned, which is a continuation of Ser. No. 696,325, , abandoned. This application Mar. 9, 1976, Ser. No. 665,292

Int. Cl.[2] C22C *37/06;* **C21D** *5/00*

U.S. Cl. 148—35 **4 Claims**

1. Heat-treated cast grinding members for use in a grinding mill, wherein said members are subjected to abrasion and repeated impacts, which members are made of a casting consisting essentially in weight percentage of chromium and carbon limited to a range defined by a closed area of a chromium-carbon coordinate diagram having the following coordinates:

Cr = 22%; C = 2%
Cr = 27%; C = 3%
Cr = 14%; C = 2%
Cr = 19%; C = 3%

the balance being essentially iron with the usual impurities; said casting having been subjected to a hardening heat-treatment from a temperature between 950° C to 1100° C, the temperature for hardening increasing within the range in accordance with the following relationship: $\%Cr - 5 \times \%C$, and subsequently to a tempering heat-treatment at a temperature between 440° C and 530° C, the temperature for tempering increasing within the range in accordance with the following relationship: $\%Cr - 5 \times \%C$, in such a manner as to evidence a metallographic structure constituted by eutectic carbides and a matrix, which matrix is free of pearlite and includes a martensitic solid solution containing less than 3% of residual austenite, and pro-eutectoidic carbides, said heat-treated casting having a Rockwell C hardness of at least 59.

4,043,843

ABRASION RESISTANT, HEAT HARDENABLE, STAINLESS STEEL

Harry Tanczyn, Baltimore, Md., assignor to Armco Steel Corporation, Middletown, Ohio

Continuation-in-part of Ser. No. 555,708, March 5, 1975, abandoned, which is a division of Ser. No. 354,243, April 25, 1973, abandoned. This application Aug. 4, 1976, Ser. No. 711,636

Int. Cl.[2] C22C *38/28, 38/34*

U.S. Cl. 148—37 **5 Claims**

1. Heat hardened stainless steel fabricated product having good corrosion resistance, and an abrasion resistance of less than 4,500 milligrams per 1,000 cycles by the test herein described, consisting essentially of, in weight percent, from about 1.8% to about 5% carbon, up to about 1.0% manganese, greater than 1.5% to about 4.5% silicon, about 11.5% to about 18% chromium, up to about 1% nickel, greater than about 4% to about 10% titanium, up to about 1.5% molybdenum, and balance essentially iron exept for incidental impurities.

4,043,844

HEAT-TREATED CAST GRINDING MEMBERS

Michel J. Feltz, rue Hotteux, 14e, Ayeneux, Belgium

Continuation of Ser. No. 406,102, Oct. 12, 1973, abandoned, which is a continuation of Ser. No. 175,200, Aug. 26, 1971, abandoned. This application May 19, 1976, Ser. No. 688,004

Claims priority, application Luxembourg, Sept. 1, 1970, 61624; Sept. 1, 1970, 61625

Int. Cl.[2] C22C *38/22*

U.S. Cl. 148—37 **20 Claims**

1. Heat-treated cast grinding members for use in a grinding mill wherein said members are subjected to abrasion and re-

peated impacts in the presence of a wet corrosive medium, said members essentially of

0.5% to 2.8% carbon,

15.0% to 35.0% chromium

the balance being essentially iron except for manganese and silicon, the optional addition of which is known in the production of wear-resistant castings and normal impurities; wherein the total percentage by weight of carbon and chromium must satisfy the relationship

$$\%Cr - 8 \times \%C = 11 \text{ to } 16\%;$$

said heat-treated members having been subjected to processing including hardening without subsequent tempering from a temperature range of from 1075° to 1175° C in such a manner as to evidence a metallographic structure of primary chromium carbides in a ferrite-free matrix which is a predominantly martensitic solid solution consisting essentially of from 0.30% to 0.45% of carbon and from 14% to 18% of chromium, and said members having a Rockwell "C" hardness of at least 60.

4,043,845

CARBON STABILIZED COBALT-RARE EARTH MAGNETIC MATERIALS

Norman J. Dionne, Arlington Heights, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 28, 1975, Ser. No. 636,177

Int. Cl.² H01F *1/02*; C22C *23/00*; B22F *3/00*

U.S. Cl. 148—105 **6 Claims**

1. A magnetic composite material comprised of powder particles, each particle comprising a bulk mixture of rare earth, cobalt, and elemental carbon constituents, and a protective overlayer of elemental carbon.

4,043,846

METHOD OF PRODUCING FERROMAGNETIC METAL POWDER BY GASEOUS REDUCTION OF SILICON COMPOUND-COATED RAW MATERIAL

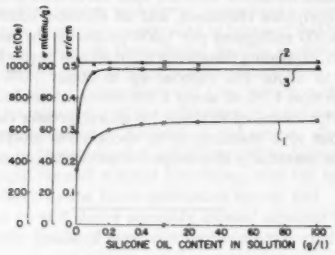
Masahiro Amemiya, Hino, and Seiichi Asada, Hachioji, both of Japan, assignors to Hitachi, Ltd. and Hitachi Maxell, Ltd., both of Japan

Filed Mar. 17, 1976, Ser. No. 667,549

Claims priority, application Japan, Mar. 17, 1975, 50-31178; Mar. 17, 1975, 50-31177

Int. Cl.² H01F *1/02*; C22C *1/04*; B22F *3/00*

U.S. Cl. 148—105 **24 Claims**



2. A method of producing ferromagnetic metal powder comprising the steps of:

i. coating a starting raw material powder with a solution containing more than 0.05 g/l of one silicon compound selected from the group consisting of sodium silicate, potassium silicate, silicic acid, potassium metasilicate, magnesium silicate, cobalt silicate, calcium metasilicate, metasilicic acid, sodium metasilicate and silicone oil and a solution containing ions of a silver compound in which the content of silver compound is more than 0.02 g/l, said raw material being at least one selected from the group consisting of oxalate, formate, oxide and oxyhydroxide of iron,

ii. drying said powder coated at step (i),

iii. heating said powder at temperature ranging from 200° to 700° C. in a reducing atmosphere, and

iv. cooling said powder reduced in the preceding step (iii).

4,043,847

HARDENING PROCESS FOR CRANKSHAFTS

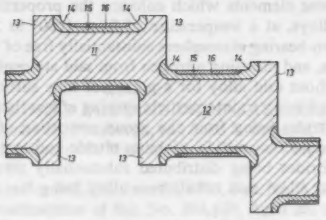
Karl Just, Immenstaad, Germany, assignor to Motoren- und Turbinen-Union Friedrichshafen GmbH, Germany

Filed Nov. 24, 1975, Ser. No. 634,775

Claims priority, application Germany, Nov. 22, 1974, 2455285

Int. Cl.² C21D *9/30*

U.S. Cl. 148—146 **10 Claims**



1. A process for hardening a crankshaft which includes bearing locations defined by crank pins, journal pins and crank webs with the respective transitional areas between the crank pins, journal pins and crank webs being rounded areas, the process comprising:

hardening all bearing locations and rounded areas of the crankshaft to provide a hardening layer of a predetermined depth at the bearing locations and rounded areas;

tempering the hardening layer at the bearing locations and rounded zones to a predetermined hardness value which permits subsequent alignment of the crankshaft at the rounded areas;

hardening only the bearing locations without affecting the rounded areas so as to provide a further hardening layer having a predetermined depth on the first mentioned hardening layer; and

tempering the entire crankshaft to eliminate internal stresses therein.

4,043,848

METHOD OF FABRICATION OF INSULATED GATE FIELD EFFECT SEMICONDUCTOR DEVICES

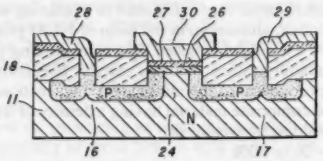
Bernard Bazin, Paris, France, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed June 23, 1972, Ser. No. 265,854

Claims priority, application France, Apr. 30, 1971, 71.15577

Int. Cl.² H01L *21/316*

U.S. Cl. 148—187 **8 Claims**



1. A process for the fabrication of an insulated gate field effect transistor comprising the steps of:

forming an adherent, apertured mask of silicon oxide on a monocrystalline silicon body of one conductivity type,

said mask having an oxygen-impermeable film on selected areas thereof including a gate area and areas where ohmic contacts are to be formed;

exposing the masked body to a suitable dopant for inducing the opposite conductivity type in the apertured surface regions of said body;

exposing the masked body to an oxidizing atmosphere, whereby the silicon surface is selectively oxidized at locations not protected by said oxygen-impermeable film;

selectively removing the oxide and oxygen-impermeable films fromthe ohmic contact areas; and

depositing and patterning a conductor film on the structure to form a gate electrode on said remaining oxygen-impermeable film, in combination with source and drain electrodes extending through the oxide in contact with said regions of opposite conductivity type.

4,043,849

PLANAR DIFFUSION METHOD FOR AN I²L CIRCUIT INCLUDING A BIPOLAR ANALOG CIRCUIT PART

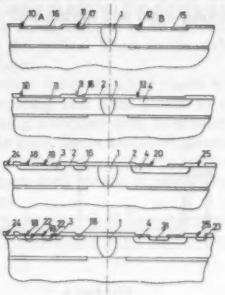
Wolfgang Kraft, and Lothar Blossfeld, both of Freiburg, Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Oct. 23, 1975, Ser. No. 625,339

Claims priority, application Germany, Nov. 8, 1974, 2453134

Int. Cl.² H01L *21/22, 21/265, 29/72*

U.S. Cl. 148—187 **8 Claims**



1. A planar diffusion method for the monolithic integration of an I²L circuit of the type including a bipolar analog circuit part including the steps of diffusing highly doped intermediate layers into a substrate, depositing an epitaxial layer on the surface of said substrate and said intermediate layers, producing an isolation region for insulating an I²L circuit part from a bipolar analog circuit part and depositing a diffusion masking layer on the surface of said epitaxial layer and said insulating region, comprising:

opening windows in said masking layer over the base and injector regions of said I²L part and the base region of said bipolar analog circuit part;

depositing a second masking layer in the windows over the base and injector regions of said I²L circuit part of such a thickness that during following treatment with an etching agent, the semiconductor material below said base and injector window is again exposed;

prediffusing a first doping material of a first concentration into the remaining opening in said bipolar analog circuit part for forming a prediffused base region;

removing excessive doping material from the diffusion masking layer and simultaneously exposing said substrate in the I²L circuit part base and injector regions;

depositing a second doping material having a concentration of smaller than said first concentration on the exposed regions of said epitaxial layer; and

simultaneously diffusing the base and injector regions of said I²L circuit part and the base region of said bipolar analog circuit part prior to emitter diffusion.

4,043,850

POLYMERIC-COATED HMX CRYSTALS FOR USE WITH PROPELLANT MATERIALS

Richard E. Hoffman, Sandy, Utah, and Edward K. Lindsay, Cumberland, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 6, 1976, Ser. No. 712,417

Int. Cl.² C06B *45/10*

U.S. Cl. 149—19.4 **4 Claims**

1. A propellant composition comprising:

a binder material,

a propellant material, and

a crystalline oxidizer fuel,

said binder and material and said fuel being incorporated in said propellant material and said oxidizer fuel consisting of:

cyclotetramethylenetetranitramine (HMX) crystals having a dry film polyurethane primary coating formed on the crystals by catalytically reacting a solution of a poly-aryl isocyanate with water to an isocyanate-to-hydroxyl ratio of about 3:1.

4,043,851

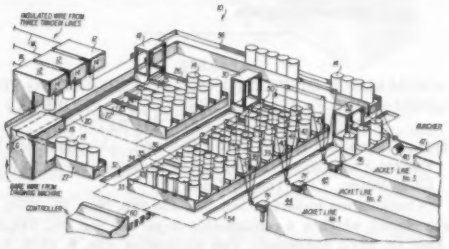
METHOD AND APPARATUS FOR CONTINUOUS PRODUCTION OF NM CABLE

James F. Holladay; R. Emory Starnes; Bobby C. Gentry; W. Carl Jones, all of Carrollton, Ga., and James O. Lowery, Ranburne, Ala., assignors to Southwire Company, Carrollton, Ga.

Filed Dec. 23, 1975, Ser. No. 643,689

Int. Cl.² G05G *15/00*

U.S. Cl. 156—47 **21 Claims**



1. System for continuous production of insulated multi-strand electrical cable comprising:

a. a first station having means for coiling insulated single strand conductor wires in a plurality of wire pack containers;

b. a second station having means for coiling bare ground wire in a plurality of wire pack containers;

c. means for transporting said containers to selected ones of a plurality of conveyor paths adapted to convey said containers to a plurality of third stations, the wire in each of said containers having a leading end and a trailing end, said conveyor paths including accumulation conveyors adapted to accumulate a plurality of said containers in tandem array so as to facilitate connecting the trailing ends of wires in each of said containers with the leading ends of wires in the following containers;

d. programmable controller means for operating said system in accordance with a predetermined program;

e. means for monitoring the supply of containers on each of said conveyor paths;

f. means responsive to said monitoring means and operatively connected to said programmable controller means for transmitting information to said programmable controller means;

g. said programmable controller means including means for

processing the information transmitted from said monitoring means and for generating signals to said transporting means to deliver selected ones of said types of electrical conductor wires to selected ones of said third stations in accordance with said predetermined program;

h. means for paying-out wire from said containers located at said third stations, including means for bringing together two insulated wires and one bare wire from their respective containers;

i. means for automatically removing depleted ones of said containers from said conveyor paths and for advancing the next container to said respective third station for continuous paying of wire therefrom;

j. means for continuously jacketing wire payed-out of said containers; and

k. a return conveyor line for conveying depleted ones of said containers from said third stations back to the first and second stations.

10. Method of handling electrical conductor wires in a continuous system for the production of multi-strand electrical cable comprising:

a. coiling a plurality of types of electrical conductor wires in respective wire pack containers;

b. transporting said containers to a plurality of processing stations along a plurality of conveyor paths;

c. monitoring the supply of containers on each of said conveyor paths;

d. transmitting information to a programmable controller as a function of the supply of containers monitored on said conveyor paths; and

e. processing the information transmitted to the programmable controller and generating signals to deliver selected ones of said types of electrical conductor wires to selected ones of said processing stations in accordance with a predetermined program.

4,043,852

ANOMALOUS DISPERSION GLASS EXHIBITING THE ANOMALOUS PARTIALLY DISPERSING PROPERTY IN THE LONG WAVE LENGTH REGION

Tetsuro Izumitani, Hino; Yasuo Fukuoka, Akishima, and Toshiharu Yamashita, Hachioji, all of Japan, assignors to Hoya Glass Works, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 526,996, Nov. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 316,607, Dec. 19, 1972, abandoned. This application Aug. 9, 1976, Ser. No. 712,617

Claims priority, application Japan, Dec. 20, 1971, 46-103521

Int. Cl.[2] C03C *3/08, 3/10, 3/30*

U.S. Cl. 106—53 **7 Claims**

1. An anomalous dispersion glass exhibiting an ηd value of 1.54–1.71 νd value of 55–30 and the remarkable anomaly of the partial dispersing property in the long wave length region, which contains B_2O_3 45–70 mol%, PbO 5–30 mol%, Na_2O 1–15 mol%, SiO_2 0–10 mol%, Al_2O_3 5–25 mol%, one or more components selected from the group consisting of CaO, BaO, MgO and CdO 0–16 mol%, and any one component selected from the group consisting of TiO_2, ZrO_2, $Sb_2O_3WO_3$ and Tl_2O 0–3 mol%, wherein F ion may be added to said oxide mixture in such amount that the F/O ion ratio in the resulting glass lies in a range of 0–0.35.

4,043,853

METHOD OF RENOVATING A SERIES OF IDENTICAL BATHTUBS

Matthew L. Saladino, 31 Pine Hill Road, Old Tappan, N.J. 07675

Filed Mar. 5, 1976, Ser. No. 664,228

Int. Cl.[2] B32B *35/00*

U.S. Cl. 156—94 **5 Claims**

1. A method of renovation of at least one existing bathtub for multi-unit dwellings or the like, said method comprising in sequence the steps of:

lining the exposed exterior surface of the existing bathtub including that portion defining the bathtub cavity with a pliable molding material of a thickness generally equal to that of the liner to be applied to the existing bathtub plus that of the working mold;

applying a mass of curable, pliable, initial mold material to the molding material lined existing bathtub to form an initial mold;

curing said initial mold,

removing said initial mold from said molding material lined bathtub,

inverting said initial mold,

applying a mold release agent to the outer surface of the initial mold,

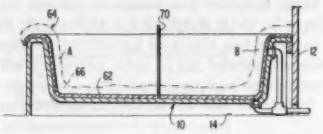
applying at least one fiberglass and resin layer to said initial mold and curing said resin to form the base material of a working mold,

applying a gel coat to the outer surface of the fiberglass and resin working mold and curing said gel coat to complete said working mold,

removing the working mold from the initial mold,

applying a mold release agent to the gel coat surface of the working mold to a form a portion of a liner and curing said gel coat,

applying at least one fiberglass and resin layer to the gel coat on said working mold and curing said resin to complete said liner,



removing the finished liner from the working mold,

applying adhesive to at least the exposed outer surface of the existing bathtub corresponding to that of the liner,

nesting the liner within the existing bathtub,

pressing the liner into contact over the full adhesive coated bathtub and curing said adhesive to complete renovation of the bathtub by applying a liner of slightly larger size and of equal configuration to the existing bathtub,

removing protruding drain fittings from the exposed surface of said existing bathtub prior to lining of the exposed surface of the bathtub with pliable molding material and forming holes within the fiberglass and resin liner conforming to the drain openings prior to nesting and adhesively fixing the liner to the existing bathtub and completing the renovation of the bathtub by sealably replacing the drain fittings onto the openings within the liner at respective drain locations, and

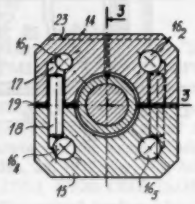
wherein prior to nesting of the liner within the existing bathtub, said method further comprises roughening, cleaning and degreasing the exterior exposed surface of the existing bathtub which receives said liner, and said step of adhesively fixing the liner to the exposed exterior surface of said existing bathtub comprises applying an impervious structural adhesive to the cleaned, roughened surface of the bathtub and an accelerator to the surface of the fiberglass liner which contacts the existing bathtub surface upon nesting of the liner within the bathtub.

4,043,854

METHOD AND APPARATUS FOR SPLICING OPTICAL FIBER CABLES

Georges E. Le Noane, Batiment C, 43 Ar Sante; André M. Mathern, route du Busquet, Brelevenez, and Gabrielle Morizur, Les Fontaines, batiment L, n° 141, all of Lannion, France (22300)

Filed Nov. 24, 1976, Ser. No. 744,595
Claims priority, application France, Nov. 26, 1975, 75.36176
Int. Cl.[2] B65H 69/02; G02B 5/16
U.S. Cl. 156—158 8 Claims



1. The method of splicing the optical fibers of an optical fiber cable including an axial core, fibers and a jacket where said fibers are mounted around the cable core and substantially parallel thereto, including the steps of:

unsheathing the cable at spaced out places corresponding to the ends of the cable sections to be spliced;

rigidly securing the optical fibers to the cable core at the unsheathed places;

covering the fibers at the unsheathed places with shell means and rigidly securing said shell means to the fibers, said shell means being provided with longitudinal bores;

sawing said cable core, fibers and shell means along a plane perpendicular to the cable whereby said shell means is divided into two shell means segments registering with each other; and

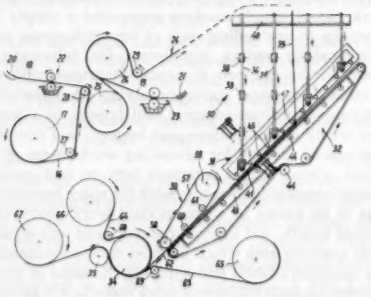
connecting said registering shell means segments by aligning the bores thereof and inserting columns therein.

4,043,855

MULTI-LAYER ARTICLE AND A PROCESS AND AN APPARATUS FOR ITS MANUFACTURE

Claude Guy Patin, Pont-Audemer, France, assignor to Compagnie des Etablissements Dela Risle, Paris, France

Filed Mar. 3, 1975, Ser. No. 554,707
Claims priority, application France, Mar. 1, 1974, 74.06985; Feb. 12, 1975, 75.04295
Int. Cl.[2] B31F 1/00
U.S. Cl. 156—178 8 Claims



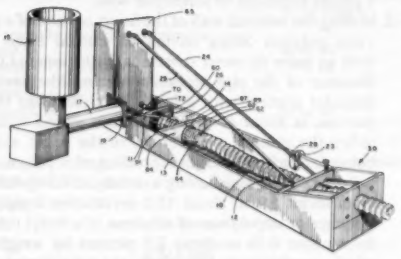
1. A process for continuously manufacturing an article which comprises at least two thicknesses of pliable and thin material, effected by folding a single continuous strip or web of the said material, wherein the said strip or web is folded on itself regularly, concertina-fashion, thereby forming alternate loops in zig-zag formation, each second portion of one of the said loops partially covering the first associated portion of the same loop and being partially covered in the same proportion by the first portion of the following contiguous loop, the said loops being flattened, and the said portions being fixed one upon the other while overlapping so as to form a multi-layer strip or web, each face of the said strip having applied thereto before the loops are formed a series of heat-bonding filaments, parallel to the edges of the said strip, and with a regular spacing from one another, the filaments on one face being able to be offset relatively to the filaments of the other face.

4,043,856

APPARATUS AND METHOD FOR PRODUCING FLEXIBLE PLASTIC TUBING

William L. Steward, Costa Mesa, Calif., assignor to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Filed July 11, 1975, Ser. No. 595,119
Int. Cl.[2] B31C 1/00
U.S. Cl. 156—195 12 Claims



1. In an apparatus for producing a flexible plastic corrugated tubing having rotating mandrel means on which a continuous ribbon of molten plastic is spirally wrapped with successive adjacent convolutions being partially overlapped and having a spiral rib extending convolutely along the exterior surface, the improvement comprising:

a plurality of elongated rollers being axially spaced apart to form a passageway therebetween through which said tubing is directed from said mandrel means said plurality of said rollers engaging said rib of said tubing and wherein at least one of said rollers is rotatably driven along its elongated axis, and means for increasing and decreasing the angle between the roller axes and the rib for decreasing and increasing, respectively, the distance between adjacent rib convolutions.

11. In a method for producing flexible plastic corrugated tubing by extruding a continuous molten thermoplastic ribbon and wrapping said ribbon around a mandrel in successive and partially overlapping adjacent convolutions to form said tubing having an inclined spiral rib extending along the exterior surface thereof the improvement comprising:

directing said tubing into a passageway extending between a plurality of elongated rotatable rollers each of which overlie a plurality of adjacent rib convolutions, maintaining contact of said rollers only on said rib portion of said tubing surface while simultaneously rotating at least one of said rollers and wherein said rollers each extend along and rotate about an axis having an angle of less than 90° from the inclination of said spiral rib and whereby the distance between adjacent rib convolutions on said tubing is decreased by increasing said angle and increased by decreasing said angle.

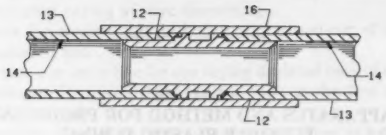
4,043,857
METHOD OF JOINING PLASTIC PIPE

Michael F. Byrne, Long Island City, N.Y., and Douglas V. N. Powelson, Audubon, Pa., assignors to Allied Chemical Corporation, Morris Township, N.J.

Division of Ser. No. 372,119, June 21, 1973, Pat. No. 3,961,814, which is a division of Ser. No. 77,489, Oct. 2, 1970, Pat. No. 3,768,841, which is a continuation-in-part of Ser. No. 868,139, Oct. 21, 1969, abandoned. This application Nov. 12, 1975, Ser. No. 631,331

Int. Cl.[2] F16L *21/00*

U.S. Cl. 156—198 **2 Claims**



1. A method of joining polyethylene pipe sections which comprises:

1. heating the internal wall of the end of a high molecular weight polyethylene pipe section at about 470°–530° F. for a period sufficient to soften the wall,
2. heating the external wall of the insert portion of a polyethylene polymer fitting having an annular insert portion with an outer diameter substantially the same as the inner diameter of the pipe section to be joined thereto and a shoulder portion with a larger diameter than the insert portion, at about 470°–530° F. for a period sufficient to soften the external wall surface of the insert, said fitting being formed of a reaction product of a polymer or copolymer of ethylene having a density of 0.940–0.950, with from about 5.0 to about 15.0 percent by weight of the polymer or copolymer of ethylene of a butyl rubber and from about 0.30 to about 2.5 percent by weight of the ethylene polymer or copolymer of a bifunctional phenolic composition having ortho functionality and the para position of the phenol ring substituted with an inert hydrocarbon radical selected from the group consisting of alkyl, aryl, alkyl-aryl and arylalkyl radicals of up to 16 carbon atoms,
3. removing the pipe end and the fitting from the heat source,
4. fitting the insert portion of the coupling into the pipe section so that the edge of the pipe substantially abuts the shoulder portion of the fitting, and
5. crimping the pipe to the insert to cause fusion therebetween.

2. A method according to claim **1** wherein an externally positioned sleeve is fitted over the crimped pipe joint assembly and affixed thereto.

4,043,858
PLASTIC NAME TAG HOLDER

Edward Dantowitz, Chestnut Hill, Mass., assignor to Albany Novelty Mfg. Co., Boston, Mass.

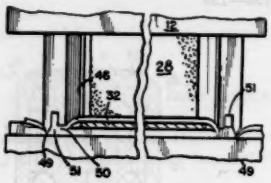
Division of Ser. No. 586,508, June 12, 1975, Pat. No. 3,969,063. This application Feb. 11, 1976, Ser. No. 657,072

Int. Cl.[2] B29C *17/00*; B29D *23/00*

U.S. Cl. 156—251 **12 Claims**

1. A method for manufacturing plastic name tag holders on a dielectric sealing machine comprising the following steps:

a. placing a bottom plastic sheet on the lower platen of the sealing machine;
b. overlying the bottom plastic sheet with at least one horizontal insert finger having a substantially U-shaped horizontal perimeter;
c. placing a top plastic sheet over the insert finger;
d. contacting the upper surface of the top sheet with a compression block to press said top sheet horizontally against the insert finger;
e. maintaining the compression block in engagement with the upper surface of the top sheet while contacting said top sheet with a horizontal substantially U-shaped electrode die, the substantially U-shaped inner periphery of said die being slightly wider than the substantially U-shaped perimeter of the insert finger, said die and said insert finger being in vertical telescopic registration, said



die drawing said top sheet downwardly around the perimeter of said insert fingers and out wardly against the horizontal upper surface of the bottom sheet, said electrode die electronically sealing the top and bottom sheets together around the periphery of said insert finger; and
f. raising the electrode die from the top sheet and removing the completely sealed name tag holder from the insert finger, said name tag holder having a cavity formed by said insert finger between the top and bottom sheets in which the top sheet is parallel to the bottom sheet.

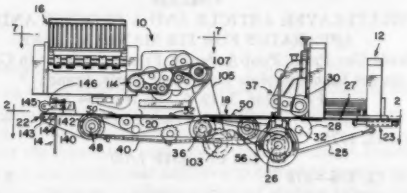
4,043,859
LABEL APPLYING MACHINE

John F. Van Dam, Westmont, and Jaroslaw Pacholok, Downers Grove, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Mar. 31, 1975, Ser. No. 563,750

Int. Cl.[2] B65C *9/06*

U.S. Cl. 156—566 **9 Claims**



1. A machine for applying labels to mailing pieces or similar work pieces which machine comprises a supply hopper for receiving an upstanding stack of the work pieces and having a reciprocating feeding mechanism for delivering the work pieces one-by-one from the stack, a transport system including an endless transport conveyor having a horizontally disposed run extending from adjacent said hopper to a label applying area which is spaced from said hopper, said conveyor having lugs spaced thereon for advancing work pieces of a predetermined normal length, alternate lugs on said conveyor being readily removable so as to enable the space between successive lugs to be varied to accommodate work pieces of twice the normal length, and a label applying head unit mounted at said label applying area which includes driven mechanism for feeding successive labels and applying the same in predetermined position on each successive work piece as it is advanced to said label applying area by said lugs, power drive means for operating said transport conveyor at a predetermined speed, a drive connection between said conveyor drive means and said hopper feeding mechanism which includes a clutch having first and second operating positions for selectively changing the

speed of operation of said work piece feeding mechanism between first and second speeds according to the speed of advance of the lugs on said transport conveyor whereby to feed the work pieces from the hopper in properly timed relation for delivery to said transport conveyor and a drive connection between said transport conveyor drive means and said label applying head unit which includes means for selectively varying the speed of the label applying mechanism according to the speed of said transport conveyor and the spacing of the lugs on said transport conveyor thereby to time the application of the labels for properly positioning them on the work pieces.

4,043,860

METHOD OF GROWING SINGLE CRYSTALS OF NEODYMIUM PENTAPHOSPHATE

Thomas R. Au Coin, Ocean; Abraham Schwartz, Oakhurst; John G. Gualtieri, Oceanport, and Melvin J. Wade, Howell, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 24, 1977, Ser. No. 761,913

Int. Cl.[2] **B01J** *17/04, 17/20;* **C01B** *25/38;* **C01F** *17/00*

U.S. Cl. 156—624 **12 Claims**

1. Method of growing single crystals of neodymium pentaphosphate greater than 1 centimeter in size and of high purity and quality from polyphosphoric acid solutions, said method including the steps of

A. heating orthophosphoric acid contained in a first crucible made of a material that is leakproof and highly resistant to acid attack to about 200° C,

B. adding neodymium oxide to the acid in the ratio of 0.5 to 3.0 grams of oxide per 50 milliliters of orthophosphoric acid,

C. increasing the temperature to a temperature of about 350° C,

D. placing the first crucible in a second crucible, larger than the first crucible, said second crucible containing phosphoric acid and being made of a material that is leakproof and highly resistant to acid attack,

E. placing lids over said first and second crucibles, and heating the double crucible configuration in a furnace at a temperature of about 500° C to 650° C for about 24 to 48 hours,

F. removing the lids from said crucibles and adding several seed crystals to said first crucible, and

G. replacing the lids on the crucibles and maintaining the furnace at about 500° C to 650° C until maximum growth of the single crystals are obtained.

4,043,861

PROCESS FOR POLISHING SEMICONDUCTOR SURFACES AND POLISHING AGENT USED IN SAID PROCESS

Herbert Jacob, and Ingolf Lampert, both of Burghausen, Germany, assignors to Wacker-Chemitronic Gesellshaft fur Elektronik Grundstoffe mbh, Burghausen, Germany

Filed Dec. 9, 1976, Ser. No. 749,194

Claims priority, application Germany, Jan. 13, 1976, 2600990

Int. Cl.[2] **C09K** *13/00*

U.S. Cl. 156—636 **8 Claims**

1. A process for polishing semiconductor surfaces which comprises preparing an aqueous suspension of a hydroxide of a member of the group consisting of aluminum, gallium, and a mixture of the two, by precipitating the hydroxide from an aqueous solution containing a salt of said elements with an alkaline compound at a pH value between 7.5 and 8, thus forming the suspension, adding to said suspension an alkali hypochlorite in such an amount that in addition to 0.05 -0.6 mol hydroxide per liter the molar content of the hypochlorite per liter will be three to ten times that of the hydroxide, and subjecting the surfaces to a buffing action with said suspension.

4,043,862

FIRE RESISTANT VERMICULITE COMPOSITION BOARD AND METHOD OF MANUFACTURE

James R. Roberts, Sao Paulo, Brazil, assignor to Eucatex S. A. Industria E Gomercio, Sao Paulo, Brazil

Filed July 21, 1975, Ser. No. 597,451

Int. Cl.[2] **D21H** *3/22, 3/28, 3/66;* **D21J** *1/08*

U.S. Cl. 162—135 **19 Claims**

1. Fire resistant vermiculite composition board comprising a felted, dried sheet comprising in dispersed admixture:

	% by weight
Heat-expanded vermiculite particles	40 to 90
Ceramic clay particles	5 to 20
Hydrated cellulosic gel having a TAPPI drainage time of at least 900 seconds	10 to 30.

14. The process for the manufacture of fire resistant vermiculite composition board which comprises:

a. heating vermiculite to a temperature for a duration predetermined to partially expand the vermiculite to a degree of from 40 to 98% of its capacity for heat expansion,

b. forming an aqueous slurry of board-forming consistency comprising:

	% by weight
The partially expanded vermiculite of step "a"	40 to 90
Ceramic clay particles	5 to 20
Hydrated cellulosic gel having a TAPPI drainage time of at least 900 seconds	10 to 30

c. vacuum forming the slurry into a wet sheet on a board-forming screen, and

d. drying the sheet.

4,043,863

PROCESS FOR SIZING CELLULOSE FIBERS WITH SULFAMOYLCHLORIDES

James Axel Christer Bjorklund, Saltsjo-Boo, and Turid Ekengren, Sollentuna, both of Sweden, assignors to Kemanord Aktiebolag, Stockholm, Sweden

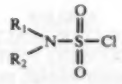
Filed Mar. 1, 1976, Ser. No. 663,000

Claims priority, application Sweden, Mar. 20, 1975, 7503209

Int. Cl.[2] **D21D** *3/00*

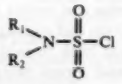
U.S. Cl. 162—158 **6 Claims**

1. A process for sizing cellulose fibers or cellulose fiber-containing materials wherein cellulose fibers in aqueous suspension or in paper products are reacted with at least 0.001% by weight based on the weight of the dry cellulose fibers of a sizing agent, said sizing agent being a compound having the general formula



wherein R_1 is an organic, hydrophobic group having 8 to 40 carbon atoms and R_2 is an alkyl group having 1 to 7 carbon atoms or has the same meaning as R_1.

5. A sizing composition for cellulose fibers in aqueous suspension or in paper products comprising an aqueous in dispersion of at least one emulsifier and a sizing agent having the general formula



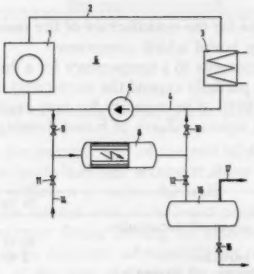
wherein R_1 is an organic, hydrophobic group having from 8 to 40 carbon atoms and R_2 is an alkyl group having 1 to 7 carbon atoms or has the same meaning as R_1.

4,043,864

NUCLEAR POWER PLANT HAVING A PRESSURIZED-WATER REACTOR

Hans-Günther Heitmann, Buckenhof, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Dec. 22, 1972, Ser. No. 317,604
Claims priority, application Germany, Dec. 22, 1971, 2163695
Int. Cl.[2] G21C *19/30*
U.S. Cl. 176—37 **1 Claim**



1. The nuclear power plant having a pressurized water reactor connected in a primary circulatory loop wherein a pump is also connected for circulating a coolant therein, an electromagnetic filter device having an inlet and an outlet and connected by said inlet and said outlet in direct shunt with a portion of the primary circulatory loop so that a portion of the coolant is passed therethrough and nuclear waste contained in the coolant is filtered-out therein, an inlet valve and an outlet valve respectively connected to said inlet and said outlet of said filter device and, in turn, connecting said filter device in parallel with the primary circulatory loop, a rinsing line and a waste line for said filter device, a rinsing line valve connecting said inlet of said filter device to said rinsing line, and a waste line valve connecting said outlet of said filter device to said waste line, said inlet and said outlet valves being closable so as to discontinue the flow of coolant through said electromagnetic filter device from said primary circulatory loop, and said rinsing line valve and said waste line valve being openable so as to flush accumulated waste out of said filter device independently of the continued circulation of coolant in the primary circulatory loop.

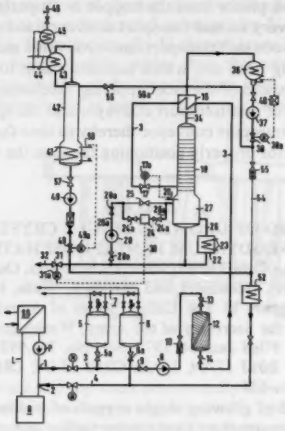
4,043,865

PRESSURIZED-WATER REACTOR COOLANT TREATMENT SYSTEM

Ivan Kausz, Weiher; Helmut Stünkel, and Harald Wille, both of Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 12, 1974, Ser. No. 450,346
Claims priority, application Germany, Mar. 12, 1973, 2312228
Int. Cl.[2] G21C *9/00*
U.S. Cl. 176—37 **5 Claims**

1. A pressurized-water reactor having a main coolant loop containing circulating pressurized-water coolant containing boron, and a coolant treating system comprising a gas stripper and a rectification column and means for removing a flow of said coolant from said loop and passing said flow through said stripper and column and back to said loop; wherein the improvement comprises said means being for passing said flow first through said column and thereafter through said stripper said system includer means for controllably shutting off said



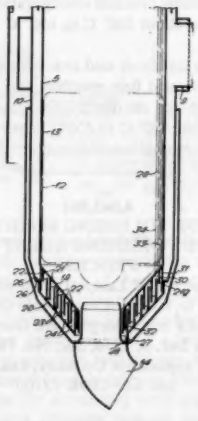
stripper and bypassing said flow around said stripper for passage of said flow from said column back to said loop.

4,043,866

LIQUID METAL COOLED FAST BREEDER NUCLEAR REACTORS

John Graham Durston, Northwich, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Nov. 25, 1974, Ser. No. 526,822
Claims priority, application United Kingdom, Dec. 6, 1973, 56704/73
Int. Cl.[2] G21C *1/02*
U.S. Cl. 176—40 **3 Claims**



1. A liquid metal cooled fast breeder muclear reactor comprising:

a pool of liquid coolant within a closed container having a roof,

a housing extending from the roof of the container into the coolant and having a lower end wall,

a heat exchanger having a tube bundle and depending from the roof of the container within but spaced from the housing and immersed in the pool of coolant, the heat exchanger having a shell with side walls surrounding said

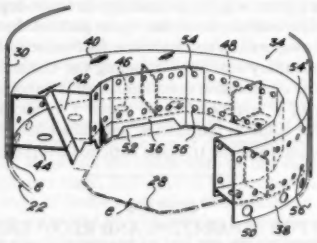
tube bundle, said shell having a lower end wall carrying a multiplicity of downwardly extending generally co-axial skirts defining a series of gas retaining jackets at the lower end of the shell, and the lower end wall of the heat exchanger housing having a multiplicity of generally coaxial inverted skirts defining a series of liquid containing jackets, one inverted skirt extending into each gas retaining jacket, the gas retaining jackets each containing a pocket of gas bounded by the upper regions of the gas containing jackets and the surfaces of the coolant in each side of the associated inverted skirts, said downwardly extending skirts and the gas retaining jackets thereby defined being within the lateral extent of the side walls of the shell so as to minimize the lateral extent of the heat exchanger.

4,043,867

STRUCTURE FOR REDUCING CONVECTION CURRENTS WITHIN THE PRESSURE VESSEL OF A FAST REACTOR

Jean-Pierre Benqué, Paris; Jean Lallement, Verrieres-le-Buisson, and Paul Lambert, Echirolles, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 28, 1975, Ser. No. 608,611
Claims priority, application France, Sept. 3, 1974, 74.29932
Int. Cl.[2] G21C *15/20*
U.S. Cl. 176—40 **5 Claims**



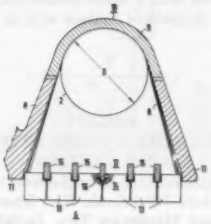
1. In a fast nuclear reactor of the type having a pressure vessel, a reactor core, support means for supporting the reactor core within the vessel, a liquid metal coolant and means for circulating the liquid metal coolant through the core, the improvement comprising an inner tank spaced from and surrounding said reactor core to define an annular space between said reactor core and said inner tank, heat exchanger means within said pressure vessel for receiving liquid metal coolant from said reactor core and discharging said liquid metal coolant into said inner tank, pump means within said pressure vessel for pumping said liquid metal coolant from said inner tank to said reactor core for circulation therethrough and a structure for reducing convection currents of said coolant within said pressure vessel comprising a hollow metallic ring supported by said support means and located within said annular space, said ring having walls provided with a plurality of holes with the width of said ring being smaller than the width of said annular space and the height of said ring being equal at a maximum to the height of said reactor core.

4,043,868

WATER-COOLED NUCLEAR REACTOR WITH LOSS-OF-COOLANT PROTECTION

Leonhard Irion, Ruckersdorf; Jürgen Tautz, Erlangen, and Gerhard Ulrych, Erlangen-Tennenlohe, all of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Oct. 30, 1975, Ser. No. 627,206
Claims priority, application Germany, Nov. 20, 1974, 2455060
Int. Cl.[2] G21C *9/00*
U.S. Cl. 176—50 **6 Claims**



1. A water-cooled reactor comprising a pressure vessel having a vertical, substantially cylindrical side wall having an inside; a vertical, substantially cylindrical core barrel having an outside and upper and lower ends; said inside and outside being radially interspaced and forming therebetween an annular, coolant descent space; said side wall having a plurality of coolant inlet openings adjacent to said upper end of said core barrel and interspaced circumferentially with respect to the side wall and through which openings coolant normally flows into said descent space; and for each one of said openings, a check-valve assembly comprising a row of individually-swinging flap valves and means for positioning said row so that coolant flow through the opening must pass through the flap valves; said flap valves being normally held open by inward coolant flow through the opening into said descent space and closing in the event coolant starts to flow outwardly through the opening from the descent space: wherein the improvement comprises said means being in each instance a chamber open to and extending downwardly from the coolant inlet opening and having an open lower end positioned above the core barrel's said lower end and substantially conforming in contour to a segment of said descent space, said chamber having means for mounting said row of flap valves in its said open lower end so that coolant flow through the chamber's said open lower end must pass through the flap valves, said chamber having side walls confining coolant flow through the chamber to a downward direction.

4,043,869

WATER INSOLUBLE BIOLOGICALLY ACTIVE MATERIAL

Sidney Alan Barker, and Charles John Gray, both of Birmingham, England, assignors to Koch-Light Laboratories, Ltd., England

Continuation of Ser. No. 379,403, July 13, 1973, abandoned. This application Oct. 1, 1975, Ser. No. 618,590
Claims priority, application United Kingdom, July 13, 1972, 32911/72
Int. Cl.[2] C07G *7/02*
U.S. Cl. 195—63 **36 Claims**

1. Biologically active material which comprises a water-insoluble solid with a surface to which molecules of diazotized m-diamino-benzene are linked by adsorption, and biologically active protein molecules chemically bonded to said molecules of diazotized m-diamino-benzene.

4,043,870

PROCESS OF PURIFYING CHOLESTEROL OXIDASE

Timothy W. Evans, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 11, 1976, Ser. No. 685,489
Int. Cl.[2] C07G 7/028
U.S. Cl. 195—66 R 38 Claims

1. In a process of isolating cholesterol oxidase from an aqueous processing solution containing a nonionic surfactant, the improvement comprising removal of nonionic surfactant from said aqueous processing solution by contacting said aqueous processing solution with a water-immiscible solvent and precipitation of the cholesterol oxidase with an effective amount of a salt.

4,043,871

ENZYMATIC SUBSTRATE COMPOSITION ADSORBED ON A CARRIER

Kjell Gunnar Blixt; Sven Ivan Arvid Tornmarck, both of Malmo; Rolf Juhlin, Akers Styckebruk; Karl Rune Salenstedt, Upplands Vasby, and Mandayam Tiru, Jarfalla, all of Sweden, assignors to Kommanditbolaget Kockums Chemical AB & Co., Malmo, Sweden

Continuation-in-part of Ser. No. 354,412, April 25, 1973, abandoned. This application July 18, 1974, Ser. No. 489,667
Claims priority, application Sweden, Apr. 18, 1974, 7405199
Int. Cl.[2] G01N 33/00; C07G 7/02
U.S. Cl. 195—99 18 Claims

1. A carrier-substrate combination, comprising

1. a solid granular carrier with a specific surface area of at least 50 m^2/g; and
2. a substrate-containing layer in which said substrate is an enzymatic substrate capable of undergoing an enzymatic reaction, said layer derived by impregnation of the carrier with a substrate-containing non-aqueous liquid and fixedly bound to said carrier by adsorption;

said substrate being present in the carrier-substrate combination in an amount of at least 25% by weight of the carrier-substrate combination; said substrate having a solubility of less than 0.1% by weight in water at 20° C and being stable and free from hydrolysis and dissolution in the absence of its specific enzyme; and said carrier being inert to said substrate.

4,043,872

POLYIODOTHYRONINE IMMUNOASSAY

Judith I. Blakemore, Mill Valley; Richard K. Leute, Sunnyvale, and Roberta D. Ernst, Mountain View, all of Calif., assignors to Syva Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 551,566, Feb. 20, 1975, abandoned. This application Dec. 29, 1975, Ser. No. 644,408
Int. Cl.[2] G01N 31/14
U.S. Cl. 195—103.5 A 12 Claims

1. A method for determining the presence of thyroxine in a medium suspected of containing said thyroxine, which comprises:

bringing together in an aqueous liquid zone: (1) said medium; (2) soluble ENZ-bound-thyroxine; and (3) antithyroxine, said antithyroxine having sites common to and capable of binding to said thyroxine and said ENZ-bound-thyroxine, wherein ENZ is an enzyme selected from malate dehydrogenase or tricore phosphate isomerase and both of which are reversibly inhibited by said thyroxine and said antithyroxine is present at a concentration resulting in substantial enhancement of said enzyme activity in the absence of thyroxine; and

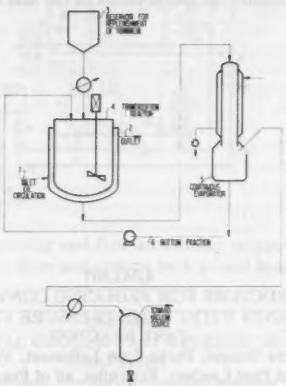
analyzing in said zone for the effect of said medium on the enzymatic activity of said ENZ-bound-thyroxine.

4,043,873

PLURAL STAGE RECOVERY OF TRIOXANE IN A PROCESS HAVING A MOLECULAR DISTILLATION STEP

Jacob Ackermann, Wigoltingen, Switzerland; Pierino Radici, Turate (Como); Umberto Santini, Legnano (Milan), and Paolo Colombo, Saronno (Varese), all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Continuation of Ser. No. 480,449, June 17, 1974, abandoned. This application Apr. 19, 1976, Ser. No. 677,952
Claims priority, application Italy, June 15, 1973, 25410/73
Int. Cl.[2] B01D 3/12
U.S. Cl. 203—46 15 Claims



1. A process for the separation of trioxane from a solution comprising trioxane, formaldehyde and water, which consists of subjecting the said solution to evaporation in equipment suitable for instantaneous distillation at temperatures, pressures and residence times which substantially eliminate deposition of polymers of formaldehyde on the cooler parts of the apparatus used in said evaporation and minimize the formation of by-products by secondary reactions including the Cannizzaro reaction under the evaporation conditions, with a vaporization and condensing of a quality of from about 5 to about 15% by weight of the solution introduced, and subsequently recovering the trioxane from the trioxane enriched overhead product.

4,043,874

PROCESS FOR SEPARATING AND RECOVERING THE CONSTITUENTS OF AN EXHAUSTED SOLVENT MIXTURE USED FOR CLEANSING REACTORS FOR THE POLYMERIZATION OF VINYL CHLORIDE

Francesco Testa, Bresso (Milan), and Antonio Bigliani, Saronno (Varese), both of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Dec. 16, 1976, Ser. No. 751,250
Claims priority, application Italy, Dec. 23, 1975, 30688/75
Int. Cl.[2] B01D 3/36; B08B 3/08
U.S. Cl. 203—47 7 Claims

1. A process for separating and recovering the constituents of an exhausted toluene-dimethylformamide solvent mixture used for cleansing surfaces of equipment used for the polymerization of vinyl chloride by removing the deposits of polymer therefrom, which comprises:

a. adding water to said exhausted solvent mixture and then distilling off toluene in the form of an azeotropic mixture with water, the amount of added water and the amount of toluene distilled off being so adjusted as to ensure in the distillation residue a water content of at least 2.5% by weight and a toluene content not exceeding 10% by weight;

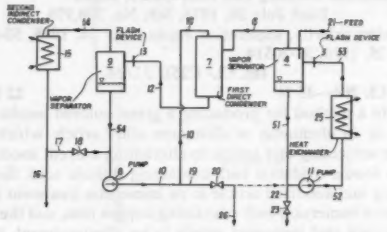
b. cooling said distillation residue, thereby to precipitate the polymer present therein;
c. adding to the resulting suspension water in an amount of at least 20% of the weight of the dimethylformamide present therein;
d. distilling off any toluene still present in the suspension;
e. recovering the precipitated polymer from the residual suspension obtained in (d) and recovering by distillation the dimethylformamide from the resulting aqueous solution.

4,043,875

TWO-STEP FLASH TECHNIQUE FOR VAPORIZING RADIOACTIVE LIQUIDS

Gundolf E. Rajakovics, Vienna; Heinz Gabernig, Graz, and Guenter Peter Klein, Vienna, all of Austria, assignors to Vereinigte Delstahlwerke AG. (VEW), Vienna, Austria

Continuation-in-part of Ser. No. 328,065, Jan. 30, 1973. This application Dec. 17, 1975, Ser. No. 641,770
Claims priority, application Austria, Feb. 2, 1972, 842/72
Int. Cl.[2] B01D *3/00*
U.S. Cl. 203—82 **19 Claims**



1. In a process for vaporizing a radioactive liquid by a two-step vaporization technique employing at least one unit having first and second flash-vaporization stages, wherein in each unit liquid is introduced to the first vaporization stage to be circulated, heated and flash-evaporated and wherein vapor resulting from the flash-evaporation of the liquid in the first vaporization stage is condensed in a first direct condenser, the improvement wherein the condensing step is accomplished by means of enriched liquid obtained from the second vaporization stage and applied via a circulating pump to the first condenser to form therein a mixture of the liquid obtained from the second vaporization stage and the condensate of the vapor from the first vaporization stage, and wherein the process further comprises the steps of flash-evaporating said mixture in the second vaporization stage and of withdrawing a portion of enriched liquid from the loop formed by said second vaporization stage, said circulating pump, said first direct condenser, and the connecting conduits therebetween.

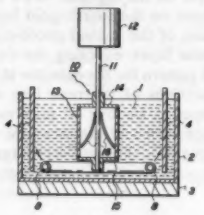
4,043,876

METHOD FOR ELECTROFORMING

Peter G. Hambling, Reading, England; Leslie W. Owen, deceased, late of Kingsclere, England; by Elizabeth Bertram Owen, executrix, Kingsclere, and by George Mould, executor, Orpington, both of England, assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 307,699, Nov. 17, 1972, abandoned. This application Mar. 29, 1976, Ser. No. 671,240
The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.
Int. Cl.[2] C25D *1/02, 1/20*
U.S. Cl. 204—9 **3 Claims**

1. A method of electroforming which consists essentially of:
a. providing an apparatus for electroforming which consists essentially of:
1. a tank suitable for containing an electroplating bath;
2. an anode and a cathode located in said tank in a position to allow a plating current to pass between said anode and cathode, said cathode being a former onto which a metal coating is electroformed, said cathode being centralized in said tank and located further from said tank walls than said anode, said anode located adjacent said tank walls;
3. means for filtering and circulating said electroplating bath connected to said tank;
4. a closed loop feeding pipe located in said tank between said anode and said cathode for feeding an electrolyte



into said tank, said closed loop feeding pipe having a plurality of apertures which are located such that the flow of said electrolyte is directed toward an inward facing surface of said anode surface;
5. means for passing a plating current between said anode and cathode; and
6. means to rotate said cathode such that its surface has a linear viscosity through said electroplating bath at least about 30 cm. per second;
b. providing said electroplating bath containing a source of copper and zinc having the following composition:

Cu metal	40 – 25 gm/liter
Zn metal	2.4 – 3.4 gm/liter
Sodium Carbonate	40 – 4.4 gm/liter
Free OH	10 – 1.5 gm/liter
pH	about 12

c. said former cathode having a current density in the range of about 10–13 amps/dm^2; and
d. rotating the former during the electroplating such that its surface has a linear velocity through the bath of about 323–395 cm. per second.

4,043,877

METHOD FOR THE MANUFACTURE OF MICROSCOPICALLY SMALL METAL OR METAL-ALLOY STRUCTURES

Burkhard Littwin, Hohenschaeftlarn, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 15, 1976, Ser. No. 667,074
Claims priority, application Germany, Mar. 19, 1975, 2512115
Int. Cl.[2] C25D *5/02;* **C25F** *3/14*
U.S. Cl. 204—15 **24 Claims**

1. A method for manufacture of microscopically small metal or metal alloy structures particularly a method for manufacture of a memory with cylindrical magnetic domains on one storage layer which memory has manipulative patterns, domain extenders, detector strips, guide loop generators, domain annihilators, control lines, and read lines formed on the storage layer comprising the steps of providing a storage layer; vapor depositing an Ni-Fe layer on a surface of the storage layer; providing a first photo-resist layer on the Ni-Fe layer, exposing the photo-resist layer with at least one pattern corresponding to a pattern selected from a group including patterns for guide loop generators, domain annihilators, control lines and read lines; developing the first photo-resist layer to form a channel exposing a portion of the Ni-Fe layer corresponding to each of

the selected patterns; electroplating a first gold layer on the exposed portions of the Ni-Fe layer; electroplating a nonmagnetic Ni-P layer on the first gold layer; electroplating a second gold layer on the nonmagnetic layer; electroplating a third gold layer on the second gold layer; subsequently removing the remaining portions of the first photo-resist layer; applying a second photo-resist layer; exposing the second photo-resist layer with at least one pattern corresponding to the desired manipulation patterns and domain extenders; developing the photo-resist layer to expose the Ni-Fe layer with a pattern corresponding with each of said patterns; electroplating a fourth gold layer on the exposed Ni-Fe layer; electroplating a thick Ni-Fe layer on the fourth gold layer; removing the remaining portions of the second photo-resist layer; applying a third photo-resist layer; exposing the third photo-resist layer for the desired pattern for the detector strips, with said pattern overlapping portions of the read line; developing the third photo-resist layer to remove all portions except that for the desired detector strips; ething away the exposed Ni-Fe layer which was vapor deposited on the storage layer; and removing the remaining portions of the third photo-resist layer.

4,043,878

ELECTROPLATING METHOD

Robert F. Ehrsam, Monroe, Conn., assignor to John L. Raymond, Fairfield and Robert Z. Reath, Easton, both of Conn.

Filed June 14, 1976, Ser. No. 696,073

Int. Cl.[2] C25D *15/00, 3/02*

U.S. Cl. 204—16 **11 Claims**

1. In the method of electrolytically depositing on the surface of a substrate metal a layer of a metal having a plurality of discrete particles of a finely divided solid non-metallic material uniformly dispersed throughout said layer, said metal layer and said particles being co-deposited from an aqueous electrolyte solution containing said metal in solution and said particles in suspension therein, said electrolyte solution containing a surface active agent deposition promoter for the non-metallic material and being agitated to maintain the particles uniformly in suspension therein, the improvement which comprises employing as said deposition promoter a surface active agent selected from the group having the chemical structure:

Where

R_1 is an alkyl, alkene or alkyne radical having from 6 to 22 carbon atoms,

R_2 is an alkyl or hydroxyalkyl radical having from 1 to 4 carbon atoms, and

R_3 is an alkyl or hydroxyalkyl radical having from 1 to 4 carbon atoms.

4,043,879

ELECTROLYTICALLY INDUCED POLYMERIZATION UTILIZING BISULFITE ADDUCT FREE RADICAL PRECURSOR

Steven Levinos, Chatham, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Division of Ser. No. 273,903, July 21, 1972, Pat. No. 4,012,295. This application Sept. 1, 1976, Ser. No. 719,539

Int. Cl.[2] B44C *1/04;* **C25B** *3/00*

U.S. Cl. 204—18 PC **3 Claims**

1. A method of forming an image which comprises:

a. providing imaging material comprising an electrically-conductive support having a surface comprising a substantial proportion of metallic copper, said surface bearing a layer of a composition comprising:

1. a polymerizable ethylenically unsaturated compound, and

2. an aldehyde/bisulfite adduct;

b. contacting the exposed surface of said layer with a cathode exhibiting a pattern of electrical conductivity corresponding to said image;

c. arranging a source of electrical potential in circuit with said cathode and said electrically-conductive support, said support constituting the anode of the arrangement;

d. causing electrical current to flow through said layer in accordance with said image pattern of said cathode, thereby effecting image-wise migration of cupric ions into and generation of polymerization-inducing species in said composition layer with concurrent polymerization of said polymerizable compound;

e. separating said cathode from said composition layer; and

f. removing unpolymerized composition from said layer.

4,043,880

METHOD FOR PRODUCING GREEN-COLORED ANODIC OXIDE FILM ON ALUMINUM OR ALUMINUM BASE ALLOY ARTICLES

Kiyomi Yanagida; Tadashi Hirokane; Tadashi Tsukiyasu, and Tomoari Sato, all of Nagoya, Japan, assignors to Sumitomo Aluminum Smelting Co., Ltd., Osaka, Japan

Filed July 26, 1976, Ser. No. 708,978

Claims priority, application Japan, July 24, 1975, 50-90848; Feb. 25, 1976, 51-20514

Int. Cl.[2] C25D *11/24*

U.S. Cl. 204—35 N **22 Claims**

1. In a method for producing a green colored anodic oxide film on an aluminum or aluminum alloy article which comprises subjecting said article to alternating current anodization in an anodic oxidation bath containing sulfuric acid, then subjecting said anodized article to an immersion treatment into an aqueous immersion bath containing copper ions, and thereafter subjecting said immersed article to an aftertreatment, the improvement wherein said immersion bath further contains an acid.

4,043,881

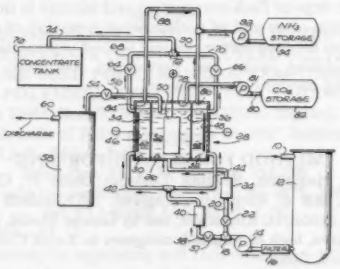
ELECTROLYTIC RECOVERY OF ECONOMIC VALUES FROM SHALE OIL RETORT WATER

Teh Fu Yen, Altadena, and Chaur-Shyong Wen, Los Angeles, both of Calif., assignors to University of Southern California, Los Angeles, Calif.

Filed Aug. 23, 1976, Ser. No. 716,857

Int. Cl.[2] C25B *1/00, 3/00*

U.S. Cl. 204—102 **9 Claims**



1. A process for the recovery of economic values from shale oil retort water, said retort water including soluble material comprising substantial portions of inorganic, acidic organic and basic organic components, said process comprising:

defining an electrolytic cell having a cathode chamber electrolytically operative with an anode chamber, an anode in said anode chamber and a cathode in said cathode chamber, each disposed for contacting aqueous solution therein;

delivering said shale oil retort water to said cell as said aqueous solution;

applying a direct current potential across said anode and cathode chambers at a current density above about 50 A/m^2 for a time sufficient to effect a substantial decrease of organic compounds in the retort water in said anode chamber and to evolve a substantial amount of ammonia from the retort water in said cathode chamber; and

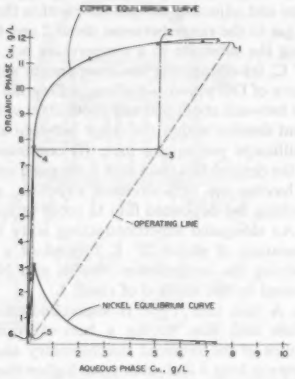
recovering said evolved ammonia.

4,043,882

SELECTIVE SOLVENT EXTRACTION PROCESS FOR COPPER FROM NICKEL

Roald R. Skarbo, Lexington, Mass.; Hal D. Peterson, Boulder, and Edmond A. Morin, Aurora, both of Colo., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed June 28, 1972, Ser. No. 266,986
Int. Cl.[2] C72B *15/10, 23/04*
U.S. Cl. 204—106 **7 Claims**



1. A process for selectively extracting copper from an aqueous ammoniacal solution containing copper and nickel and having a pH above about 9 which comprises contacting said aqueous solution with a water-immiscible organic oxime extractant in a plurality of extraction stages to effect copper ion transfer from the aqueous solution to the oxime extractant and hydrogen ion transfer from the oxime extractant to the aqueous solution in accordance with the equation:

$$(2R^oH)_{organic} + (Cu^{++})_{aqueous} \rightarrow (R^o{}_2Cu)_{organic} + (2H^+)_{aqueous}$$

where R^o is the organic moiety fo the oxime, said solution and extractant being flowed countercurrently between stages, the mole ratio of exchangeable hydrogen ion in the oxime extractant, prior to contact with the aqueous solution, to copper ion in the aqueous solution, prior to contact with the oxime extractant, being maintained between about 1.8 and 2.4.

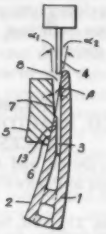
4,043,883

ELECTROLYTIC PRECISION DRILLING PROCESS

Jorg Puhr-Westerheide, Birkenau, Germany, assignor to MTU-Motoren-und Turbinen-Union, Munich, Germany

Filed Aug. 18, 1976, Ser. No. 715,571
Claims priority, application Germany, Aug. 30, 1975, 2538652
Int. Cl.[2] B23D *1/00*; C25F *3/00*
U.S. Cl. 204—129.65 **4 Claims**

1. An electrolytic precision drilling process for making at least one hole in a workpiece, the axis of which hold has an inclination of between 2° and 20° relative to the surface of the workpiece, by means of least one tubular electrode through which a stream of an electrolyte is directed onto the workpiece, comprising the step of positioning a guide member during the drilling for sealing the gap between the guide member and the surface of the workpiece adjacent to the at least one hole, such that a surface of the guide member forms an angular space with the surface of the workpiece, the aperture



angle of the angular space being twice the angle of inclination of the electrode relative to the surface of the workpiece, and the apex of which is in the area of a sharp upper edge of each hole.

4,043,884

ELECTROLYTIC HYDROGENATION OF LEACHED OIL SHALE COMPONENTS

Teh Fu Yen, Altadena, and Chaur-Shyong Wen, Los Angeles, both of Calif., assignors to University of Southern California, Los Angeles, Calif.

Filed Aug. 23, 1976, Ser. No. 716,858
Int. Cl.[2] C25B *3/00*
U.S. Cl. 204—131 **5 Claims**

1. A process for upgrading the kerogen components of oil shale, comprising:

leaching carbonate minerals from said oil shale to form a porous residue;

forming a slurry of said residue with a reductive electrolytically active solution;

subjecting said slurry to reductive electrolysis; and

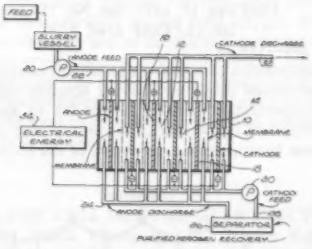
separating the reduced residue from the electrolyzed slurry.

4,043,885

ELECTROLYTIC PYRITE REMOVAL FROM KEROGEN MATERIALS

Teh Fu Yen, Altadena; Chaur-Shyong Wen, Los Angeles, and Jonathan Kwan, Monterey Park, all of Calif., assignors to University of Southern California, Los Angeles, Calif.

Filed Aug. 23, 1976, Ser. No. 716,860
Int. Cl.[2] C25B *3/00*
U.S. Cl. 204—131 **10 Claims**



1. A process for treating bituminous material for removal of pyrite therefrom, comprising:

forming an aqueous, substantially non-oxidative electrolytically active slurry of said material;

defining an electrolytic cell having a cathode chamber electrolytically operative with an anode chamber, an anode in

said anode chamber in contact with said slurry and a cathode in said cathode chamber; and

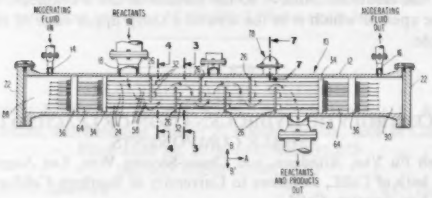
applying a direct current potential across said anode and cathode chambers at a current density of above about 50 A/m^2 to effect an electrolytic reaction of the pyrite in said material for a time sufficient for substantial removal of pyrite from said material.

4,043,886

PHOTOCHEMICAL REACTOR AND IRRADIATION PROCESS

George John Bierker, Devon, and Arnold Kivnick, Erdenheim, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Mar. 15, 1976, Ser. No. 666,816
Int. Cl.[2] B01J *1/00, 1/10*
U.S. Cl. 204—157.1 R **36 Claims**



1. A process for the radiation catalyzed reaction of reactants, performed in a photochemical reactor containing a plurality of longitudinally oriented parallel spaced funicular radiation sources, comprising the steps of:

a. passing said reactants generally longitudinally through said reactor;

b. moving, in directions, to said skew longitudinal direction, at longitudinally spaced positions within said reactor, at least a portion of said reactants thereby producing oscillating flow at least of said portion of reactants with respect to said longitudinal direction thereby promoting mixing of said reactants as said reactants pass through said reactor; and

c. irradiating the reactants;

whereby a reaction product is produced.

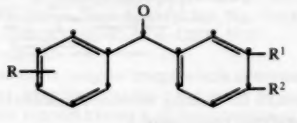
4,043,887

BENZOPHENONE INITIATORS FOR THE PHOTOPOLYMERIZATION OF UNSATURATED COMPOUNDS

James G. Pacifici; Richard H. S. Wang, and Gordon C. Newland, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 17, 1977, Ser. No. 759,688
Int. Cl.[2] C08F *2/46, 4/00*
U.S. Cl. 204—159.23 **3 Claims**

1. A composition comprising a photopolymerizable ethylenically unsaturated compound having admixed therewith, as a photo-polymerization initiator, about 0.1 to about 10% by weight, based on the weight of the unsaturated compound, of at least one benzophenone derivative of the formula



wherein

R is hydrogen, chloro, methoxycarbonyl, methyl, t-butyl, and R^1 and R^2 are the same or different and each is $—CH_2X$, CHX_2, or CX_3 wherein X is chloro or bromo.

4,043,888

SUPERCONDUCTIVE THIN FILMS HAVING TRANSITION TEMPERATURE SUBSTANTIALLY ABOVE THE BULK MATERIALS

John R. Gavaler, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 383,625, July 30, 1973, abandoned. This application Aug. 29, 1975, Ser. No. 609,137
Int. Cl.[2] C23C *15/00;* **C22C** *27/02;* **H01F** *7/22*
U.S. Cl. 204—192 S **14 Claims**

1. In a method of producing thin films of superconductor materials of the beta-wolfram type having high transition temperatures, the steps comprising (a) assembling within a closed reactor a substrate and a composite containing at least two target materials which when reacted are capable of forming the beta-wolfram crystallographic structure, (b) evacuating the reactor to a pressure not in excess of 5×10^{-10} Torr while heating the components contained within the reactor to remove all volatile impurities therefrom under said conditions, (c) admitting an inert gas which will support sputtering to the reactor and adjusting the pressure within the reactor with said inert gas to the range between about 2 and 6×10^{-1} Torr, (d) heating the substrate to a temperature not in excess of about 1000° C, (e) connecting the components within the reactor to a source of DC power while controlling the voltage within the range between about 600 and about 1000 volts and the cathode current density within the range between about 10 and about 50 milliamps per square inch, (f) continuing said sputtering until the desired film thickness is obtained on the substrate, said film having the beta-wolfram structure, and (g) thereafter quenching the deposited film to room temperature.

9. An elongated superconducting body having a transition temperature of about 22° K formed of a plurality of turns containing the composition Nb_3Ge, said Nb_3Ge having been deposited by the method of claim **1.**

12. A thin film Type II superconductor of niobium-germanium said film having a beta-wolfram crystallographic structure of the required stoichiometry and a transition temperature at least 4 Kelvin degrees higher than the bulk material of the same gross stoichiometry.

14. In a method of producing thin films of materials requiring predetermined stoichiometry, the steps comprising, in sequence, (a) assembling within a closed reactor a substrate and a composite containing at least two materials for forming a predetermined composition which materials, when reacted, form the predetermined stoichiometrical composition (b) evacuating the reactor to a vacuum of at least 5×10^{-10} Torr while heating the components contained within the reactor to remove all volatile impurities therefrom, (c) admitting an inert gas to the reactor and adjusting the pressure within the reactor with said inert gas to a range between 2 and 6×10^{-1} Torr (d) heating the substrate to a temperature not in excess of about 1000° C (e) connecting the components within the reactor to a source of DC power while controlling the voltage within the range between about 600 to about 1000 volts and the cathode current density within the range between about 10 and about 50 milliamps per square inch to effect sputter deposition of a thin film of the predetermined stoichiometry on the substrate (f) continuing said sputter deposition until the desired film thickness on the substrate, is obtained, and (g) thereafter quenching the deposited film to room temperature.

4,043,889

METHOD OF AND APPARATUS FOR THE RADIO FREQUENCY SPUTTERING OF A THIN FILM

Leroy Joseph Kochel, Fridley, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 2, 1976, Ser. No. 646,202
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—192 R **8 Claims**

1. In an RF sputtering apparatus in which a thin film is to be deposited upon a substrate that is supported by a substrate holder in a spaced relationship with a cathodic target, a

method of maintaining the DC bias voltage of said substrate holder at a constant predetermined level comprising:

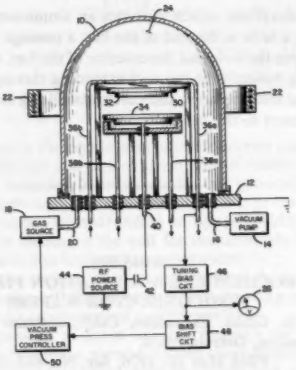
coupling an RF signal to the target of said RF sputtering apparatus;

generating an effective DC bias voltage at the substrate holder of said RF sputtering apparatus;

generating a predetermined DC shift of said DC bias voltage;

coupling a vacuum pressure modifying means to said shifted DC bias voltage for modifying the vacuum pressure within said RF sputtering apparatus in response to said shifted DC bias voltage whereby said DC bias voltage is maintained constant in accordance with a predetermined bias voltage vs. vacuum pressure characteristic of said RF sputtering apparatus.

4. In an RF sputtering apparatus in which a thin film is to be deposited upon a substrate that is supported by a substrate holder in a spaced relationship with a cathodic target, an apparatus for maintaining the DC bias voltage of said substrate holder at a constant predetermined level comprising:



RF signal source means for coupling an RF signal to the target of said RF sputtering apparatus;

a substrate holder; means coupled to said substrate holder of said RF sputtering apparatus for generating a DC bias voltage that has a predetermined bias voltage vs. vacuum pressure characteristic for said RF sputtering apparatus;

means coupled to said DC bias voltage generating means for generating a predetermined DC shift of said DC bias voltage;

vacuum pressure modifying means coupled to said RF sputtering apparatus and to said DC bias voltage shift generating means for modifying the vacuum pressure within said RF sputtering apparatus in response to said shifted DC bias voltage and controlling said DC bias voltage to remain constant in accordance with said predetermined bias voltage vs. vacuum pressure characteristic.

4,043,890

DEVICE FOR MEASURING THE TOTAL CONCENTRATION OF OXYGEN IN GASES

Hugh S. Isaacs, Shoreham, and Anthony J. Romano, Kings Park, both of N.Y., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 14, 1976, Ser. No. 695,899

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—195 S **3 Claims**

1. An electrode assembly for use in a cell for the detection of the total oxygen in a gas stream whose oxygen content is to be measured comprising:

a. a thin disc-shaped solid-electrolyte element having oppositely facing first and second surfaces;

b. a porous coating layer of metal in which oxygen will dissolve but not react covering at least a portion of the first surface of the disc-shaped element;

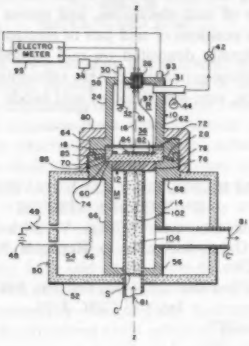
c. carbon means adjacent the second surface for producing CO by a reaction between the carbon means and oxygen;

d. housing means for supporting the disc-shaped element for partial exposure to the gas stream whose oxygen content is to be measured, such that the latter would be in contact with the second surface of said disc-shaped element;

e. annular spring sealing means surrounding and sealing the disc-shaped element to limit leakage of the measurement gas stream from the second side of the disc-shaped element into the interior of said housing means for preventing the measurement gas and a reference gas from mixing on the first side of the disc-shaped element;

f. contact means of electrically conducting material in contact with said porous coating layer of metal and extending through and out of the interior of said housing means;

g. means supplying an oxygen containing reference gas into said housing means and in contact with said porous coating layer of metal;



h. means having a heater for supplying said gas stream whose oxygen content is to be measured to said second surface and circulating it slowly through the carbon means adjacent thereto for converting all the oxygen contained in the measurement gas stream to CO at an elevated temperature for producing said CO in an equilibrium with the total amount of oxygen in the gas stream; and

i. means connected to the contact means and the second surface of the solid electrolyte element for measuring the electrical potential difference across the electrolyte as a measure of the oxygen in the gas stream to be measured;

j. the CO equilibrium directly corresponding substantially with the concentration of the total oxygen in the gas stream on the other side of the electrolyte for reducing the electronic conduction of the electrolyte at low oxygen concentrations, thus to increase the sensitivity of the electrical potential difference across the electrolyte as a measure of the total oxygen in the gas stream whose oxygen content is to be measured.

4,043,891

ELECTROLYTIC CELL WITH BIPOLAR ELECTRODES

Richard Collin Alkire, Champaign, Ill.; Werner Engelmaier, Mendham, N.J., and Thomas Jacob Kessler, East Rochester, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

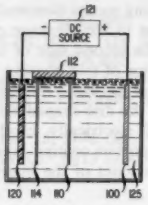
Filed Jan. 14, 1976, Ser. No. 649,041

Int. Cl.[2] C25D *3/38, 17/10, 17/12*

U.S. Cl. 204—231 **7 Claims**

1. Apparatus for electrodepositing a selected metal onto a surface comprising an electrolytic solution, means for contain-

ing said electrolytic solution, an anode of the depositing metal in said electrolytic solution, a cathode in spaced relation to said anode in said electrolytic solution, one side of said cathode being the surface on which said selected metal is deposited, a pair of metal screen electrodes intermediaate said anode and said cathode in said electrolytic solution, means for electrically interconnecting said pair of electrodes, means for positioning



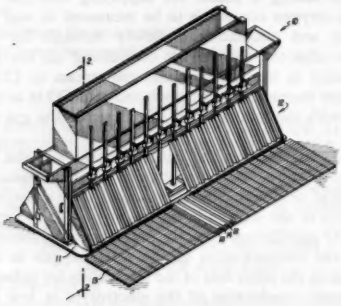
one of said electrodes in close proximity to said cathode, means for positoning the other of said electrodes between said node and said one of said electrodes, and means for periodically reversing the positions of said pair of electrodes whereby said metal is uniformly deposited on said cathode side from the electrode in close proximity thereto substantially independent of the position, size, and shape of said anode.

4,043,892

ALUMINUM REDUCTION CELL HAVING A LATERAL ENCLOSURE SYSTEM

Juan M. Gonzalez, and William V. Nichols, Jr., both of Portland, Oreg., assignors to Reynolds Metals Company, Richmond, Va.

Filed Dec. 15, 1975, Ser. No. 640,811
Int. Cl.² C25C *3/06*
U.S. Cl. 204—247 **17 Claims**



1. In an aluminum reduction cell having a row of individually adjustable prebaked carbon anodes, the improvement comprising:

a plurality of successively overlapping, alternating male and female access panels arranged to form a lateral enclosure along the cell,

said panels being pivoted on a common axis at the lower ends thereof and adapted for being opened selectively at each anode position of the cell in sets of three adjacent panels,

each such set including a male panel and a female panel on each side thereof,

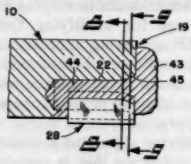
said male panel having laterally spaced outwardly directed flanges and the adjacent female panels having corresponding inwardly open flange receptacles.

4,043,893

ELECTRICAL CONTACT

Leonard Gelfand, Orange Village, Ohio, assignor to Erico Products, Inc., Cleveland, Ohio

Filed Mar. 31, 1976, Ser. No. 672,054
Int. Cl.² C25B *9/04*
U.S. Cl. 204—281 **23 Claims**



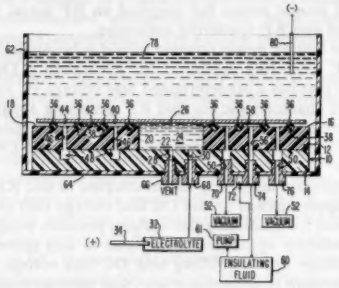
1. An electrode which includes an aluminum bar, said bar including a hole in the end of the bar, a passage means extending between the hole and the exterior of the bar, a copper insert projecting beneath the bar and extending through the passage means and into the hole, and cast metal filling such hole securing the insert to the bar.

4,043,894

ELECTROCHEMICAL ANODIZATION FIXTURE FOR SEMICONDUCTOR WAFERS

Stephen R. Gibbs, Escondido, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 20, 1976, Ser. No. 688,415
Int. Cl.² C25D *17/06, 11/02*
U.S. Cl. 204—297 W **7 Claims**



1. An anodization fixture for a semiconductor wafer comprising:

a body member having a major surface;

a plurality of closed looped ridges on said surface for supporting a semiconductor wafer, said ridges having a progressively larger perimeter with adjacent ridges defining channels therebetween;

electrical contact means in said body member for contacting one surface of the wafer, with at least one channel surrounding said contact;

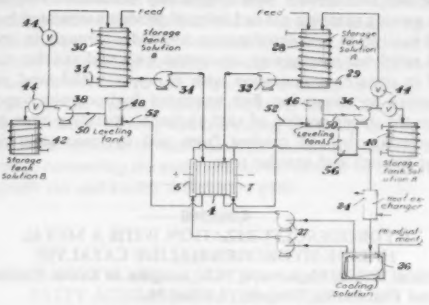
means for maintaining a vacuum in at least one channel for securing the wafer against the ridges; and

means for supplying an insulating fluid to another channel surrounding said electrical contact means to prevent electrical shorting between the contact and an anodizing solution for anodizing the wafer.

4,043,895
ELECTROPHORESIS APPARATUS

Gerhard Gritzner, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 360,990, May 16, 1973, Pat. No. 3,989,613. This application Mar. 1, 1976, Ser. No. 662,499
Int. Cl.[2] B01D *13/02*
U.S. Cl. 204—301 5 Claims

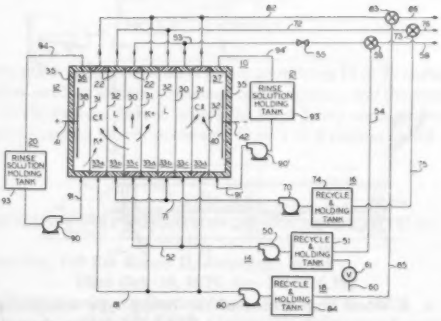


1. An apparatus for continuous electrophoresis comprising
an electrophoresis cell defined by a pair of membranes;
a permeable boundary membane in the cell generally parallel to the membranes and dividing the cell into the first and second separate compartments on opposite sides thereof;
separate inlet means on the cell for continuously feeding a separate solution into each compartment;
separate outlet means at a location spaced from the inlet means on the cell for separately withdrawing each solution from its compartment continuously;
means for passing a direct current through the cell and across the boundary membrane and compartments; and
balancing means associated with the inlets and outlets for continuously maintaining the fluid pressure in the first compartment substantially equal to the fluid pressure in the second compartment.

4,043,896
ULTRAFILTRATION AND ELECTRODIALYSIS APPARATUS

Richard M. Ahlgren, Waukesha, Wis., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Filed Mar. 25, 1976, Ser. No. 670,159
Int. Cl.[2] B01D *13/02*
U.S. Cl. 204—301 20 Claims


RINSE SOLUTION HOLDING TANK
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1. The combination of:
an enclosure,
membrane support means disposed within said enclosure, a plurality of membranes supported in spaced relation by said membrane support means to form a plurality of permeation cells within said enclosure,
electrode means disposed in spaced relation relative to the sides of said membranes, for supplying an electric field thereacross,
a first one of said membranes being selective to ions having one charge and a second one of said membranes being ion-nonselective for passing ions of either charge, and
a filtration membrane disposed between said first and second ones of said membranes to define at least one filtration cell therebetween with one side of said first one of said membranes and a permeate collecting cell with one side of the second one of said membranes,
means for delivering fluid under pressure to at least said filtration cell.

4,043,897
OIL SHALE RETORTING

Roland F. Deering, Brea, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 465,265, April 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 412,494, Nov. 2, 1973, abandoned. This application June 10, 1976, Ser. No. 694,528
Int. Cl.[2] C10G *1/02*
U.S. Cl. 208—11 R 14 Claims

1. In a process for producing a low-arsenic shale oil and a hydrogen-containing product gas wherein a stream of raw crushed, arsenic-containing oil shale is first countercurrently contacted in an eduction zone with a stream of essentially oxygen-free, hot eduction gas contaning carbon dioxide to thereby produce shale oil, an eduction off-gas and hot, essentially oil-free, coke-containing spent shale, and wherein said hot spent shale is thereafter countercurrently contacted in a gasification zone with a conversion gas mixture comprising steam and oxygen to partially combust the coke on said spent shale and thereby heat said spent shale to sufficiently high temperatures to react said steam with remaining coke, thereby producing an essentially oxygen-free, hydrogen-containing water gas, and decarbonized shale which is passed through a cooling zone communicating with said gasification zone, and wherein said eduction gas comprises a mixture of said water gas and a recycle portion of said eduction off-gas, the improvements which comprise:
1. passing said raw shale upwardly through said eduction zone;
2. maintaining an essentially oxygen-free transition zone between said eduction zone and said gasification zone;
3. passing said spent shale serially and downwardly through said transition zone, said gasification zone and said cooling zone;
4. passing serially through said cooling zone and said gasification zone sufficient of said conversion gas mixture to provide at least about 25 pounds of oxygen and at least about 100 pounds of steam per ton of raw shale, sufficient oxygen being supplied to maintain a peak temperature above about 1,000° F in said gasification zone;
5. passing said water gas through said transition zone into said eduction zone;
6. injecting all of said recycle portion of eduction off-gas into said transition zone to mingle therein with said water gas and form said eduction gas; and
7. withdrawing the non-recycled portion of said eduction off-gas as said hydrogen-containing product gas.

4,043,898
CONTROL OF FEEDSTOCK FOR DELAYED COKING

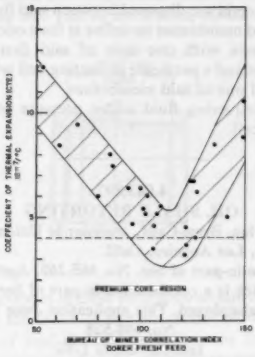
William H. Kegler, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Aug. 25, 1975, Ser. No. 607,728
Int. Cl.[2] C10G *9/14*
U.S. Cl. 208—50 6 Claims

1. In a delayed coking process for producing premium coke

wherein a petroleum derived feedstock is charged to a coker furnace, heated to coking temperature, charged to a coking drum and maintained therein at coking conditions until premium coke is formed, the improvement wherein:

a. said feedstock has a BMCI value outside the range of 95 to 130;



b. a desired BMCI value for the feedstock within the range of 95 to 130 is preselected;

c. the BMCI of the feedstock is determined prior to charging same to the coker furnace; and

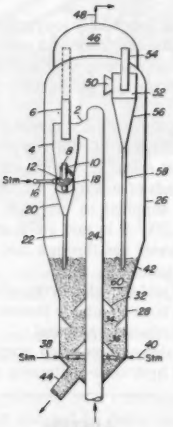
d. the BMCI of the feedstock, prior to charging same to the coker furnace, is adjusted to said preselected desired value.

4,043,899

METHOD AND MEANS FOR SEPARATING GASIFORM MATERIALS FROM FINELY DIVIDED CATALYST PARTICLES

Conroy D. Anderson, Wenonah, N.J.; Klaus W. Schatz, Philadelphia, Pa., and Paul W. Snyder, Jr., Pitman, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 27, 1976, Ser. No. 662,187
Int. Cl.[2] C10G *11/04;* B01J *8/26*
U.S. Cl. 208—161 **4 Claims**



1. In the catalytic conversion of hydrocarbons with fluid catalyst particles in a riser conversion zone the method for improving the separation of fluid catalyst particles from hydrocarbon conversion products which comprises passing a suspension of hydrocarbons and catalysts upwardly through a riser conversion zone under elevated temperature conversion conditions, passing the suspension from the riser conversion zone directly into a cyclonic separation zone wherein a first cyclonic separation is made in an upper portion thereof between fluid catalyst particles and vaporous hydrocarbon products comprising said suspension, passing the catalyst thus separated substantially immediately into a lower separate portion of said cyclonic separation zone through a restricted opening into an annular zone in the lower portion of said cyclonic separation zone and into contact with tangentially introduced stripping gas, passing stripping gas and stripped products separated from said catalyst in said annular zone upwardly through an open end restricted passageway concentric with said annular zone and in open communication with an upper withdrawal passageway for removing first separated hydrocarbon vapors from the upper portion of said cyclonic separation zone and recovering stripped catalyst from said cyclonic separation zone beneath said annular zone.

4,043,900

HYDRODESULFURIZATION WITH A METAL HALIDE-HYDROGEN HALIDE CATALYST

Michael Siskin, Maplewood, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Nov. 4, 1975, Ser. No. 628,588
Int. Cl.[2] C10G *23/02*
U.S. Cl. 208—216 **20 Claims**

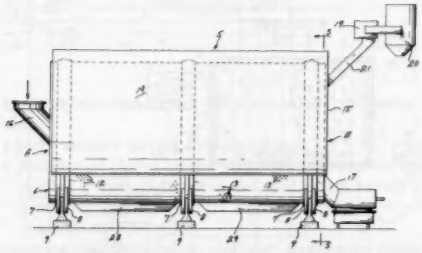
1. A hydrodesulfurization process for the removal of organic sulfur compounds from a hydrocarbon feed stock which comprises contacting said feed stock in the reaction zone with hydrogen and with an acid catalyst comprising (1) a difficultly reducible metal halide selected from the group consisting of the chlorides and bromides of gallium, and the fluorides, chlorides and bromides of tantalum, niobium, tungsten, and molybdenum, and (2) a hydrogen halide selected from the group consisting of hydrogen fluoride, hydrogen chloride, or hydrogen bromide, the ratio of hydrogen halide to metal halide being at least equal molar, wherein the temperature of said reaction zone is maintained between the melting point and the critical temperature of the catalyst components for a period of time sufficient to effect hydrodesulfurization of a portion of said organic sulfur compounds.

4,043,901

WOOD CHIP SCREENS

Warren Thomas Gauld, Mobile, Ala., assignor to Gauld Equipment Sales Company, Mobile, Ala.

Filed Dec. 3, 1975, Ser. No. 637,303
Int. Cl.[2] B07B *1/24*
U.S. Cl. 209—10 **10 Claims**



1. A wood chip screen of the rotary type comprising a screen having perforations in a first inlet portion thereof to permit passage therethrough of fines material and having perforations in a second discharge portion thereof to permit passage therethrough of acceptable chips, a hollow spiral baffle secured to the inner surface of the screen, means to separate unwanted material from the wood chips and to float said un-

wanted material into the interior of the screen, air suction means creating an air stream to withdraw from the interior of the screen the said unwanted material, said air suction means including a conduit communicating with the interior of the screen at an end thereof such that the unwanted material can pass with said air stream directly from the interior of the screen into said conduit without passing through the screen perforations, and including a fan means for drawing air from the interior of the screen into said conduit, a cyclone separator in communication with the fan, first conveyor means below the said screen to receive the fines and acceptable chips, and second conveyor means adjacent the discharge end of the screen to receive oversize wood chips, and a casing enclosing the upper half and a portion only of the lower half of the screen in spaced relation thereto, the said casing including an end closure plate adjacent to the discharge end of the screen, said conduit connecting the said fan with the interior of the screen through the said casing and closure plate.

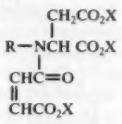
4,043,902

TRI-CARBOXYLATED AND TETRA-CARBOXYLATED FATTY ACID ASPARTATES AS FLOTATION COLLECTORS

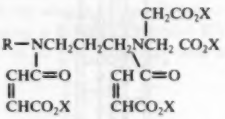
Hermen Hartjens, Sun City, Ariz., and Arnold Day, Wilton, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed June 6, 1975, Ser. No. 584,545
Int. Cl.[2] B03D *1/02*
U.S. Cl. 209—166 **17 Claims**

1. A method of beneficiating an ore selected from the group consisting of non-sulfide minerals such as sulfates, carbonates, fluorides, tungstates, phosphates and oxides, which comprises grinding said ore to flotation size, pulping the ground ore in water, and subjecting the pulp to froth flotation with a compound of the group, trivalent salts of the formula:



and tetravalent salts of the formula



where R is a long chain alkyl group containing 12 to 22 carbon atoms and X is sodium, potassium or ammonium, and the mono or di alkyl esters thereof, where the alkyl group contains from 1 to 13 carbon atoms, preferably from 1 to 8 carbon atoms.

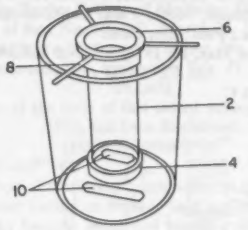
4,043,903

PROCESS FOR PROMOTION OF ALGAE GROWTH IN A SEWAGE MEDIUM

Inka Dor, 119 Ein Kerem D, Jerusalem, Israel

Filed Oct. 28, 1975, Ser. No. 626,292
Claims priority, application Israel, Nov. 8, 1974, 46022
Int. Cl.[2] B01D *13/00*; C02C *1/04*
U.S. Cl. 210—22 C **2 Claims**

1. An improved method for promoting algae growth in sewage medium comprising placing algae in pure water separated by a dialysis membrane from sewage water in the presence of light of an intensity of at least about 15,000 lux and allowing osmotic interaction to occur across said membrane as a result of the difference in concentration gradient, wherein



said dialysis membrane has a porosity in the range of about 250A to 24A.

4,043,904

WASTE WATER TREATMENT METHOD

Tsuneshi Takeda; Yasuyuki Atarashi, and Akira Mori, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Aug. 17, 1976, Ser. No. 715,009
Claims priority, application Japan, Sept. 1, 1975, 50-105012
Int. Cl.[2] C02C *5/02*
U.S. Cl. 210—28 **3 Claims**

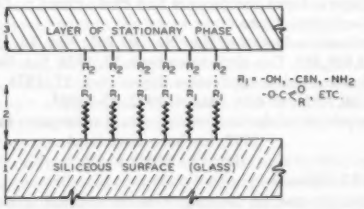
1. A process for treating waste water containing from 1 to 1000 ppm of water-soluble salts of condensates obtained by condensing, with formaldehyde, sulfonates of mono or fused polycyclic benzenoid aromatic hydrocarbons having from 1 to 12 benzene rings, which comprises the sequence of steps of: (1) adding to said waste water from 50 to 1000 ppm of at least one inorganic flocculating agent while maintaining the pH of the waste water at from about 6.5 to about 8.5 to form flocs containing a portion of said condensates and removing the resulting flocs from the waste water, and then (2) adding to the treated waste water product from step (1) from 50 to 400 ppm of activated carbon and agitating same therein for a period of time effective to absorb the condensate into the activated carbon and then filtering the activated carbon from the waste water.

4,043,905

CHROMATOGRAPHIC SEPARATION COLUMNS WITH SELECTIVELY MODIFIED ACTIVE SURFACES AND METHODS FOR THEIR PREPARATIONS

Milos V Novotny, Bloomington, Ind., and Karel Grohmann, Pasadena, Calif., assignors to Indiana University Foundation, Bloomington, Ind.

Filed Aug. 26, 1974, Ser. No. 500,226
Int. Cl.[2] B01D *15/08*
U.S. Cl. 210—31 C **4 Claims**



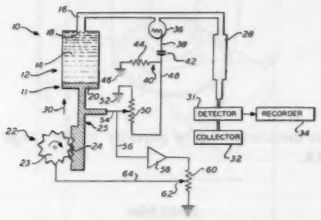
1. A method of preparing chromotographic columns comprising active surfaces fabricated of a siliceous material which method includes the step of modifying said surfaces by reaction with chlorodimethyl (4-(4-chloromethylphenyl)butyl) silane.

4,043,906

METHOD AND APPARATUS FOR REDUCING THE TRANSIENT EFFECTS OF LIQUID COMPRESSIBILITY IN A LIQUID CHROMATOGRAPHY SYSTEM

John Colville Helmer, Menlo Park, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Mar. 18, 1976, Ser. No. 668,340
Int. Cl.² B01D 15/08
U.S. Cl. 210—31 C **24 Claims**



1. In a liquid chromatography system of the type including a chromatographic column, a reservoir defining a variable volume for containing a slightly compressible mobile liquid phase, piston means cooperating with said reservoir for enabling pumping of said liquid phase through said chromatographic column, and means for normally driving said piston means at a pre-selected velocity; a method for reducing the effective systemtime constant incident to reattainment of equilibrium pressure and flow, to thereby damp the oscillatory behavior following a change in fluid pressure in said system; said method comprising:

superimposing upon said piston motion an additional velocity component proportional to the time derivative of pressure at said reservoir, and to the volume of said reservoir; to thereby damp the transient oscillations generated by compression of said liquid phase in response to said fluid pressure change.

4,043,907

PROCESS FOR TREATING WASTE PHOTOGRAPHIC PROCESSING SOLUTIONS

Isao Shimamura, and Haruhiko Iwano, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 307,265, Nov. 16, 1972, Pat. No. 3,869,383. This application Sept. 13, 1974, Ser. No. 505,877
Claims priority, application Japan, Nov. 17, 1971, 46-92115; Dec. 30, 1971, 47-634; Mar. 6, 1972, 47-22907
The portion of the term of this patent subsequent to Mar. 4, 1992, has been disclaimed.
Int. Cl.² B01D 15/06
U.S. Cl. 210—32 **20 Claims**

1. A process for treating a waste solution from a photographic treatment which solution contains at least one of ferricyanide and ferrocyanide ions comprising contacting the waste solution with a weakly basic anion exchange resin in the salt form thereby adsorbing said ions on said weakly basic anion exchange resin.

4,043,908

PROCESS FOR CLEANING OF A DISPERSION OF DISPERSED PARTICLES

Kelvin Roberts, Osterskar, and Barbro Margareta Stenqvist, Vasterhaninge, both of Sweden, assignors to Kemanord Aktiebolag, Stockholm and Sala International AB, Sala, both of Sweden

Filed Mar. 11, 1976, Ser. No. 666,104
Claims priority, application Sweden, Mar. 11, 1975, 7502720
Int. Cl.² C02B 1/20
U.S. Cl. 210—43 **8 Claims**

1. A process for purifying waste water containing organic and/or colloidal impurities obtained from de-inking of paper, which process comprises:

a. adjusting the pH to a value of about 8 or higher,

b. adding a surface active amine or amino acid to the aqueous dispersion or pulp slurry in an amount sufficient to form a micellar solution containg the organic and/or colloidal impurities, said amount exceeding the critical micelle concentration of said surfactant, said amine or amino acid being cationic at a pH of 7 or lower,

c. precipitating micelles of the micellar solution formed in step (b) by reducing the pH of the dispersion or slurry to a range of about 7 or lower, and

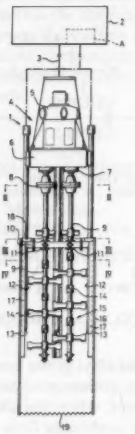
d. removing the precipitate of micelles formed in step (c).

4,043,909

APPARATUS AND METHOD FOR SOLIDIFICATION OF SLUDGES

Masaaki Endo, Saitama; Mitsuo Miura; Yoshinori Kukino, both of Tokyo; Kimio Kikuchi, Saitama, and Hayao Aoyagi, Chiba, all of Japan, assignors to Takenaka Komuten Co., Ltd., Osaka, Japan

Filed Dec. 22, 1976, Ser. No. 753,199
Int. Cl.² C02B 1/20
U.S. Cl. 210—49 **4 Claims**



4. A method for the solidification of sludge layers using a solidification apparatus comprising a solidification apparatus proper, a lifting means for moving said apparatus proper in the vertical direction, and a cylindrical casing, said solidification apparatus proper including driving means, agitating shafts driven by said driving means, agitating blades attached to the lower portions of the agitating shafts to form a kneading zone, and means for feeding a hardener into the kneading zone, said casing surrounding said kneading zone of the solidification apparatus proper, said casing being disposed so that it can shift in the vertical direction with respect to the solidification apparatus proper, said solidification method comprising:

the first step of setting the casing at the lowermost position

thereof and lowering the apparatus proper with the lifting means until the lower ends of the agitating shafts arrive at the top face of the sludge layer;

the second step of piercing the sludge layer with the apparatus proper while rotating the agitating shafts and supplying the hardener into the kneading zone until the bottom of the casing arrives at the bottom of the sludge layer and the lower ends of the agitating shafts arrive at the bottom of the sludge layer; and

the third step of lifting the solidification apparatus proper alone to the position uppermost with respect to the casing while stopping supply of the hardener but continuing rotation of the agitating shafts and then lifting the casing integrally with the solidification apparatus proper to thereby agitate the sludge entirely from the bottom to the top sufficiently to effect the solidification treatment.

4,043,910

REMOVAL OF PHOSPHOROUS FROM WASTE WATER

John Rodney Field, Hipperholme, near Halifax, England, and Kenneth Guthrie Andrew, Dundee, Scotland, assignors to Allied Colloids Limited, Bradford, England

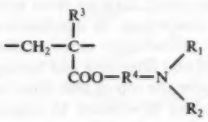
Continuation-in-part of Ser. No. 504,791, Sept. 10, 1974, abandoned. This application June 3, 1976, Ser. No. 692,607

Int. Cl.[2] C02B *1/20*

U.S. Cl. 210—53 **10 Claims**

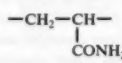
1. A process for removing phosphate from aqueous waste selected from the group consisting of raw sewage, an effluent from a primary or secondary sewage sedimentation process, and a food processing factory effluent containing phosphate comprising the steps of, in order, (1) precipitating soluble and colloidal phosphate in the waste by adding a sufficient amount of an inorganic coagulant containing a multivalent metal cation selected from the group consisting of aluminum, ferrous, ferric and calcium to the waste to precipitate soluble and colloidal phosphate therefrom, (2) adding to the waste after an interval of about 15 seconds to 4 minutes a sufficient amount of a cationic polyelectrolyte which is quaternary ammonium salt of a copolymer, having a molecular weight such that at 25° C the viscosity in centipose of an aqueous solution have a pH of 6.0, containing 1% by weight of the polymer and in the absence of added salts using a Brookfield Model RVT viscometer with spindle No. 3 at 20 rpm is greater than 2000, and consisting essentially of units of

(a)



and

(b)



in which R_1 and R_2 may be the same or different and are selected from the group consisting of hydrogen and alkyl, R^4 is alkylene containing 1 to 8 carbon atoms and R^3 is hydrogen and in which (b) is present in an amount of 80 to 97 mole % based on (a) plus (b) to flocculate the precipitated phosphate, and (3) subjecting the waste to a liquid-solids separation process.

4,043,911

STERILIZATION OF HOLDING TANKS AND TOILET BOWLS BY QUATERNARY COMPOUNDS

Joseph L. Melnick, and Craig Wallis, both of Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Division of Ser. No. 561,447, March 24, 1975, Pat. No. 3,941,696, which is a continuation of Ser. No. 426,793, Dec. 20, 1973, abandoned. This application Feb. 27, 1976, Ser. No. 662,072

The portion of the term of this patent subsequent to Mar. 2, 1993, has been disclaimed.

Int. Cl.[2] C02B *3/06*

U.S. Cl. 210—62 **20 Claims**

1. A method of sterilizing wastewater in tanks and the like, the wastewater having an organic load containing bacteria not inactivated by basicity alone and viruses comprising,

adding 10 to 400 ppm liquid quaternary compound containing a pyridinium moiety to the wastewater for 1000 ppm suspended solids in the wastewater, and

adding a liquid base to the wastewater to interact with said quaternary compound to cause said quaternary compound to inactivate said bacteria and viruses and in an amount sufficient to bring the wastewater to a pH of about 9.5 to about 10.5.

4,043,912

CLARIFICATION TANK

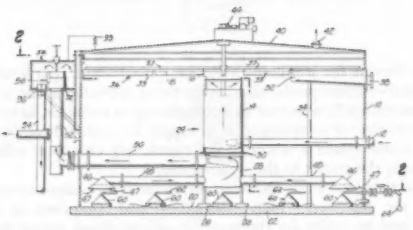
Alberto H. Bascope, and Eugene H. Grizzard, both of Huntington Beach, Calif., assignors to Burmah Oil and Gas Company, Houston, Tex.

Continuation-in-part of Ser. No. 157,343, June 28, 1971, Pat. No. 3,951,816. This application Aug. 14, 1975, Ser. No. 604,718

The portion of the term of this patent subsequent to Apr. 20, 1993, has been disclaimed.

Int. Cl.[2] B01D *17/02, 21/10*

U.S. Cl. 210—83 **10 Claims**



1. An apparatus for clarifying a liquid mixture of two liquid components, comprising:

a. a tank;

b. means for feeding said liquid mixture into said tank below the liquid surface level, for gravity separation of said mixture in said tank whereby said lighter component separates from said mixture and rises toward the liquid surface level in said tank leaving said heavier component relatively pure in the lower portion of said tank;

c. means in said tank for removing said lighter component at the liquid surface level in said tank;

d. a central collection plenum for removing said clarified heavier component from below the level of said tank where said heavier component is substantially free of said lighter component;

e. a plurality of pick-up conduits in said tank in fluid communication with said central collection plenum and extending radially therefrom in said tank; said pick-up conduits each being of equal length and equal internal diameter;

f. means exterior of said tank and in fluid communication with said central collection plenum for controlling the rate of discharge of said heavier component from said tank.

9. In a method for clarifying a liquid mixture of two liquid components in a tank having means for feeding said liquid mixture into said tank below the liquid surface level for gravity separation of said mixture in said tank, whereby said lighter component separates from said mixture and rises toward the liquid surface level in said tank leaving said heavier component relatively pure in the lower portion of said tank, comprising the steps:

a. skimming the lighter component from the liquid surface of said mixture;

b. removing said clarified heavier component from said tank through a plurality of conduits extending radially into a central collection plenum, at substantially equal flow rates through each of said conduits;

c. removing said heavier component from said tank through said collection plenum; and

d. controlling the rate of said removal from said tank.

4,043,913

DEVICE FOR STERILIZING SWIMMING-POOL WATER

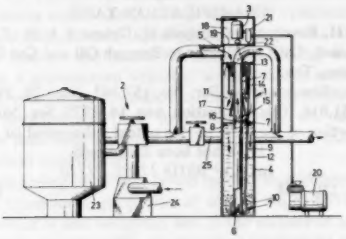
Edouard Hintermeister, 15 Notelaarweg, Keerbergen, Belgium

Filed Mar. 18, 1976, Ser. No. 667,997

Claims priority, application Belgium, Mar. 18, 1975, 826801

Int. Cl.[2] E04H *3/16*

U.S. Cl. 210—169 **5 Claims**



1. Device for sterilizing swimming-pool water, particularly of small-volume pools, said device being provided in the water regenerating flow circuit and comprising an ozonizer, in which the ozonizer is so arranged as to supply the ozone directly into the water inside a water-ozone contacting chamber without venting the ozone to the atmosphere,

the ozonizer being mounted inside the water-ozone contacting chamber, which is sealed-off and comprises an inlet and an outlet for the water to be sterilized, means being provided in said chamber for insuring the water-ozone contacting,

the water-ozone contacting chamber being of the constant level type, the ozonizer being located above the water level and so arranged as to supply the ozone through a pipe and through a diffuser dipping in the water, at the bottom of the contacting chamber, the water inlet to said chamber being located above the water level in such a way that the water to be sterilized runs into that tank portion located above the water level and containing gas escaping from the water, the water outlet being located below the water level adjacent the contacting chamber bottom, and the chamber having a water-outlet pipe, the outlet of which lies at the contacting chamber bottom, which is so arranged in said contacting chamber as to extend above the chamber water level to the inlet level of the water to be sterilized, said pipe being surrounded over a portion of the length thereof lying above said water level, by two co-axial pipe sections staggered relative to one another, a first pipe section being connected to the chamber walls below the inlet for the water to be sterilized, in such a way that said water to be sterilized flows between said outlet pipe and said first pipe section, a second pipe section surrounding the first section and being staggered relative thereto in such a way that the water flow between the outlet pipe and the first pipe section causes an underpressure between both pipe sections so that the gas present inside the contacting chamber above the water level be forced between the pipe sections and contacted with the water to be sterilized as soon as it enters the contacting chamber, said water-outlet pipe comprising at the water level inside the contacting chamber, at least one opening,

the said means for insuring the water ozone contacting including means provided in said pipe to cause a turbulence in the water flow at the level of said opening so as to feed therethrough in the pipe gas present above the water level inside the contacting chamber, said last-named means comprising, a baffle on said water-outlet pipe above said opening, said baffle being so arranged as to cause turbulences in the water flowing between said pipe and said first pipe section to insure a water-gas mixing and avoid water entering the water-outlet pipe through said opening.

4,043,914

AQUARIUM PUMP WITH AERATION

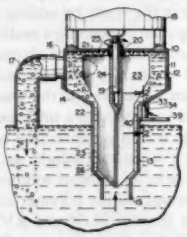
Tibor Horvath, Brooklyn, N.Y., assignor to Aquology Corporation, Newark, N.J.

Filed Aug. 19, 1976, Ser. No. 715,701

The portion of the term of this patent subsequent to July 10, 1990, has been disclaimed.

Int. Cl.[2] E04H *3/16*

U.S. Cl. 210—169 **6 Claims**



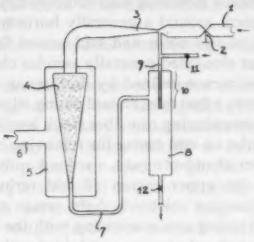
1. A pump with aeration for an aquarium filter tank, said filter tank having filter material, means supporting said filter material, and a suction outlet drawing from below said filter material, said pump comprising, in combination, a housing containing a large cylindrical upper chamber disposed at least partly above the top of said filter tank and having a tangential outlet extending out over the top of said filter tank, a smaller lower chamber extending downward to connect with said suction outlet, and a flared transition portion between said chambers, a motor fixed on top of said casing and having a vertical shaft entering said casing, a vertical impeller mounted on said shaft having a large upper portion extending above said transition portion into said upper chamber and having a smaller lower portion extending in said lower chamber below the level of water in said filter tank, said smaller lower portion primimg said upper chamber by raising water into said upper chamber where efficient pumping takes place, a projection within said transition portion having an edge in the direction said impeller moves adjacent to said projection, and air valve means controlling the flow of air through said channel into pumped fluid in said housing.

4,043,915

FILTER FOR USE WITH IRRIGATION SYSTEMS

Nahum Man, Kibbutz Merhavia, Merhavia, Israel

Filed Jan. 17, 1977, Ser. No. 759,622
Claims priority, application Israel, Jan. 30, 1976, 48942
Int. Cl.[2] B01D *21/24*
U.S. Cl. 210—195 R 2 Claims



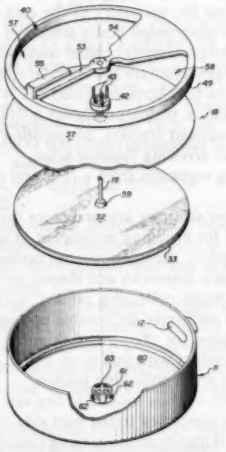
1. A filtering system comprising a hollow screening and filtering body having an inlet and an outlet, a Venturi pipe being provided in communication with the said hollow screening and filtering body, the said screening and filtering body being accommodated in a casing having an outlet, a first conduit leading from the interior of the said hollow screening and filtering body into a container from the interior of which a second conduit leads to a point co-incident with the throat of the Venturi pipe, the said second conduit being closed at its end which is within the said container, the end portion of said second conduit — so far as it extends within the container — being permeable to liquid, the said container being provided with flushing inlets and outlets.

4,043,916

ON-LINE CLOSED-VESSEL CIRCULATING FILTER FOR EDIBLE COOKING OILS

Walter A. Wecker, Sr., Delray Dunes, Boynton Beach, Fla. 33436, assignor to Wacker-Dearborn Corporation, Chicago, Ill.

Filed June 16, 1976, Ser. No. 696,650
Int. Cl.[2] B01D *35/28*
U.S. Cl. 210—238 5 Claims



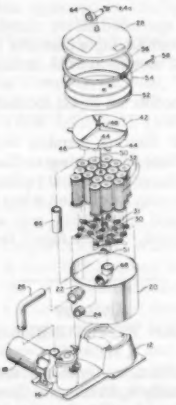
1. Vacuum filtering apparatus for use in reconditioning cooking oils comprising a vertically walled filtering vessel an inlet having an oblong cross-section formed in the vessel wall and a throat of circular cross-section smaller than the oblong throat cross-section and formed upstream of the throat, a conical vessel bottom, a centrally located suction outlet disposed at a lower gravitational level than said inlet at the apex of the conical bottom, and horizontally disposed shoulder means for supporting a filter bed assembly between said inlet and said outlet; removable cover means for said vessel; and a filter bed assembly manipulatable as a unit, including a relatively rigid foraminous member supportable at said shoulder means, lift rod means connectable to said foraminous member and having a lift rod upstanding therrefrom, and gravity clamping means for positioning a porous filter element on top of said foraminous member and having a first weight element mountable adjacent said lift rod, a second weight element radially spaced from said first weight element to define open regions therebetween exposing said foraminous member for filtering action, spanner means joining said first and second weight elements, and a one-piece radially apertured stem surrounding the suction outlet and extending upwardly from the suction outlet and vessel bottom sufficiently to support the foraminous member, together with the horizontal shoulder means, in a planar condition in the vessel and to provide, between the shoulder means and the stem, an open annular space encouraging free filtering action.

4,043,917

LIQUID FILTER APPARATUS

William N. Rowley, Palos Verdes Estates; Gordon F. Ehret, Alhambra, and Robert R. Williams, San Dimas, all of Calif., assignors to Weil-McLain Company, Inc., Dallas, Tex.

Filed Apr. 1, 1976, Ser. No. 672,732
Int. Cl.[2] B01D *27/04*
U.S. Cl. 210—323 T 5 Claims



1. A liquid filter apparatus comprising:

a vessel having an open upper end, an inlet for receiving liquid to be filtered, and an outlet for discharging filtered liquid;

a unitary assembly removably positioned in said vessel and comprising a plurality of filter units disposed in said vessel in the path of said liquid for filtering said liquid, each of said filter units comprising a perforated tube and filter means extending around said tube, said filter units being formed in at least two groups extending in a vertically stacked relationship, a plate-like member having a plurality of nipples extending from its upper surface and its lower surface and registering with the respective tubes of adjacent groups of filter units for supporting the groups of filter units relative to each other so that the respective tubes of the filter units of each group register with the tubes of the filter of an adjacent group, a collection manifold having an outlet and communicating with a plurality of said filter units for receiving the filtered liquid, and

means cooperating with said collection manifold and said support means for releasably securing said groups of filter units in said vertically stacked relationship;

means communicating said vessel outlet with said manifold outlet; and

means formed separate from said unitary assembly for providing a seal-tight cover for the upper end of said vessel.

4,043,918

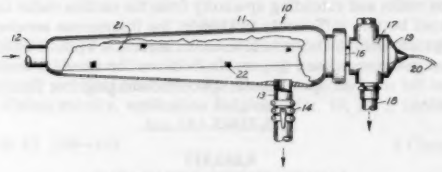
SELF CLEANING FILTER ASSEMBLY WITH FLUTTERING INNER FILTER MEMBER

Fidel Orona, El Cajon, Calif., assignor to Reed Irrigation Systems, El Cajon, Calif.

Filed May 24, 1976, Ser. No. 688,948

Int. Cl.[2] F01D *33/00, 35/20*

U.S. Cl. 210—356 **8 Claims**



1. A self cleaning filter comprising:

an elongated tubular housing having an inlet and a first outlet at its opposite ends;

a central generally tubular filtering element extending between said inlet and said first outlet within said housing, said element including a flexible inner filtering member having a multiplicity of openings and surrounded by a relatively rigid apertured sleeve member;

said filtering element having a diameter less than said housing and retained therein to form an annular space around said element;

a second outlet for filtered liquid located in the sidewall of said housing;

said flexible inner filtering member being of a generally frustoconical shape functioning to flutter in response to liquid flowing through said first outlet;

whereby said filter may be cleaned when liquid is allowed to flow through said first outlet, and said filter normally operates to provide filtered liquid through said second outlet.

4,043,919

PRESSURE SCREEN WITH TURBULENCE CHAMBER MEANS

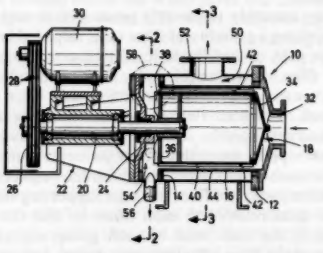
Hagen Hutzler, Reutlingen, Germany, assignor to Hermann Finckh Maschinenfabrik, Pfullingen, Germany

Filed June 8, 1976, Ser. No. 693,916

Claims priority, application Germany, June 14, 1975, 2526657

Int. Cl.[2] B01D *21/02, 21/18, 25/32, 33/36*

U.S. Cl. 210—407 **11 Claims**



1. Apparatus for treating a fibrous suspension of raw fibre stock to separate acceptable stock from waste matter including in combination, a casing, a generally cylindrical screen having a longitudinal axis, means mounting said screen in a fixed position within said housing with the longitudinal axis thereof generally horizontally disposed, said screen and said casing forming an outer chamber therebetween, a generally cylindrical rotor having an imperforate peripheral wall and a first closed end, means mounting said rotor within said screen for rotary movement around a generally horizontal axis, the peripheral wall of said rotor and said screen forming therebetween an inner elongated generally annular chamber, a turbulance chamber means defined by said casing and the second end of said rotor, a first inlet on said casing adjacent to said first rotor end for introducing raw fiber stock into said inner chamber, a first outlet on said casing for removing acceptable stock from said outer chamber means, a second outlet on said casing leading into the upper region of said turbulence chamber means for removing relatively light waste material, a third outlet on said casing communicating with the lower region of said turbulence chamber means, said third outlet functioning to remove relatively heavy waste matter, from said turbulence chamber means, a projection on said rotor at the second end thereof functioning to create turbulence within said turbulence chamber means and a second inlet in said casing for feeding diluting water into said turbulence chamber means to dilute material being introduced into the turbulence chamber means.

4,043,920

SKIMMER FOR SQUARE SETTLING TANKS

Thomas Wooh, Wilton, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Aug. 25, 1976, Ser. No. 717,637

Int. Cl.[2] B01D *21/18*

U.S. Cl. 210—525 **13 Claims**

1. In a square type continuously operating settling tank having a central feed supply, a four-sided overflow launder extending along the periphery of the tank, defining the overflow level for supernatant liquid separated from sludge settled on the tank bottom, sludge outlet means in the tank bottom, and a rotary rake structure having rake arms effective to move sludge over the tank bottom to said outlet means,

the combination which comprises a four-sided scum baffle having rounded corners, cooperating with the overflow launder in arresting floating scum,

a post rising vertically from a rake arm of said raking structure,

an horizontal skimmer arm structure turnably supported by said post for swinging movement in an horizontal plane,

a scum engaging skimmer member carried by said arm structure unitary therewith and shaped to form with the scum baffle a scum collecting pocket, said skimmer member having a resiliently deflectable bottom edge portion,

pressure means for urging said skimmer member into cooperative contact with said scum baffle, so as to form therewith said scum collecting pocket,

a scum receiving box located at one side of said scum baffle,

and a ramp connected to the inlet side of the box, said ramp and said skimmer member being constructed and arranged for cooperation with one another so that the scum collected in said pocket is trapped between said skimmer member and said ramp while being moved up the ramp and into said receiving box by said deflectable bottom edge portion of the skimmer member.

4,043,921

CELLULOSE ETHER-POLYACRYLAMIDE AQUEOUS GELS

James E. Hessert, and Richard L. Clampitt, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 611,751, Sept. 10, 1975, Pat. No. 3,971,440. This application Feb. 9, 1976, Ser. No. 656,772
Int. Cl.[2] C09K 7/02; E21B 43/22, 43/26
U.S. Cl. 252—8.5 C 6 Claims

1. A fluid-gelable composition consisting essentially of
1. water;
2. a water-thickening amount of a water-soluble polymeric mixture of (a) at least one carboxymethylcellulose ether and (b) at least one acrylamide homopolymer having a molecular weight of about 200,000 to about 16,000,000 with from 2 percent to about 75 percent of the amide groups being hydrolyzed to carboxyl groups wherein the amount of (a) present in the mixture ranges from about 25 to about 95 weight percent of the total amount of (a) plus (b);
3. from 0.05 to about 60 weight percent of a water-soluble compound of a polyvalent metal wherein the metal present is capable of being reduced to a lower valence state and which is sufficient to gel said water when the valence of at least a portion of said metal is reduced to said lower valence state, said metal compound being selected from the group consisting of ammonium chromate, ammonium dichromate, the alkali metal chromates and dichromates, chromium trioxide, and mixtures thereof; and
4. from 0.1 to at least about 200 percent of the stoichiometric amount of a water-soluble reducing agent which is effective to reduce at least a portion of said metal to said lower valence state, said reducing agent being selected from the group consisting of hydroquinone, sodium sulfide, sodium hydrosulfite, sodium metabisulfite, potassium sulfite, sodium bisulfite, potassium metabisulfite, sodium sulfite, sodium thiosulfate, ferrous sulfate, ferrous chloride, p-hydrazinobenzoic acid, hydrazine phosphite, hydrazine dihydrochloride, and mixtures thereof with the further proviso that the proportions of (a) and (b) in the water are such that the resulting gel strength of the composition is greater than that obtained with the same total polymer concentration of either (a) or (b) alone.

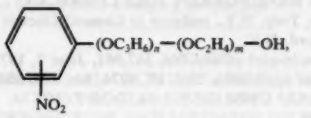
4,043,922

SECONDARY OIL RECOVERY PROCESS USING OXYALKYLATED ADDITIVES

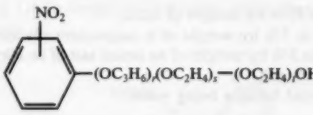
Harold A. Palmer, and Thomas E. Sample, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 451,712, March 15, 1977, abandoned. This application June 26, 1975, Ser. No. 590,650
The portion of the term of this patent subsequent to May 8, 1990, has been disclaimed.
Int. Cl.[2] E21B 43/22, 43/24
U.S. Cl. 252—8.55 D 9 Claims

1. A method of recovering hydrocarbons from a subterranean hydrocarbon-bearing formation having in communication therewith at least one injection well and at least one production well comprising:
a. injecting into the said formation through said injection well an aqueous alkaline flooding medium containing a solubilizing agent comprising a water-soluble, oxyalkylated, nitrogen-containing aromatic compound,
b. forcing said alkaline flooding medium through the formation and,
c. recovering hydrocarbons through said production well, wherein the said water-soluble oxyalkylated, nitrogen-containing aromatic compound is selected from the group consisting of:
A. a block-type, water-soluble, oxyalkylated compound of the formula:



wherein *n* is an integer of from 1 to about 10 and *m* is an integer of from 5 to about 40, and
B. a random-type, water-soluble oxyalkylated compound which has been further reacted with ethylene oxide having the formula:



wherein the sum of *r* plus *s* is an integer of from 2 to about 12 and with the proviso that *r* and *s* are each not less than 1 and *t* is an integer of from 5 to about 32 and wherein the said aqueous alkaline flooding medium contains an alkaline agent selected from the group consisting of alkali metal hydroxides, alkali metal hypochlorites, alkaline earth metal hydroxides, and mixtures thereof.

4,043,923

TEXTILE TREATMENT COMPOSITION

Basil L. Loudas, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 26, 1974, Ser. No. 446,003
Int. Cl.[2] C08K 5/02, 5/05; D06M 13/00
U.S. Cl. 252—8.75 14 Claims

1. A composition comprising a liquid vehicle containing from about 1% to about 25% by weight of a detergent-compatible organic fluorochemical compound containing about 10 to 60 weight percent carbon-bonded fluorine and having the formula $(R_fQ)_e(XCO)_mA(COOM)_p$ where R_f is fluorinated aliphatic radical of at least three carbon atoms, "Q" is a divalent linking group, "M" is a cation selected from NH_4^+, Na^+, K^+, Li^+, H^+ or is a protonated alkyl amine having from 1-6 carbon atoms in the alkyl group, "A" is a polyvalent organic radical having a valency of $m + p$ and is the residue of a polybasic organic acid or an organic anhydride, "X" is NR (wherein R is hydrogen or an alkyl group of from 1 to 14 carbon atoms), N or O and *e*, *p* and *m* are integers of 1 or 2.

7. A composition comprised of a liquid vehicle containing (1) from about 1% to about 25% of a detergent-compatible fluorochemical compound containing from about 10 to about 60 weight percent carbon-bonded fluorine and having the formula $(R_fQ)_e(XCO)_mA(COOM)_p$ where R_f is fluorinated aliphatic radical of at least three carbon atoms, "Q" is a divalent linking group, "M" is a cation selected from NH_4^+, Na^+, K^+, Li^+, H^+ or is a protonated alkyl amine having from 1-6 carbon atoms in the alkyl group, "A" is a polyvalent organic radical having a valency of $m + p$ and is the residue of a polybasic organic acid or an organic anhydride, "X" is NR (wherein R is hydrogen or an alkyl group of from 1 to 14 carbon atoms), N or O and *e*, *p* and *m* are integers of 1 or 2, and (2) compatible non-ionic or anionic detergent, said detergent being water dispersible at concentrations of at least 1% by weight and being capable of drying to a non-oily, non-tacky residue, the weight ratio of said detergent to said fluorochemical compound being on the order of 1:1 to 2:1.

4,043,924
WATER BASED GREEN TIRE LUBRICANT

Frank J. Traver, Troy, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation-in-part of Ser. No. 367,961, June 7, 1973, abandoned. This application Dec. 19, 1974, Ser. No. 534,101

Int. Cl.[2] C10M *3/18, 5/14, 7/20, 7/24*

U.S. Cl. 252—21 **1 Claim**

1. A composition for reducing the friction between an expanding fluid pressure core and the internal surface of a green tire during vulcanization, said composition comprising:

a. from 2 to 20% by weight of a high molecular weight poly(diorganosiloxane) fluid;

b. from2 to 20% by weight of a glycerol adduct of propylene oxide;

c. from 20 to 55% by weight of mica;

d. from 0.05 to 5% by weight of a magnesium silicate;

e. from 0.05 to 5% by weight of an amine salt of an alkylaryl sulfonic acid; and

f. the substantial balance being water.

4,043,925
LOW SMOKING COMPOSITION AND METHOD FOR COLD HEADING OPERATIONS

George F. Felton, Jr., Chadds Ford, Pa., assignor to Suntech, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 532,562, Dec. 13, 1974, abandoned. This application Mar. 26, 1976, Ser. No. 670,607

Int. Cl.[2] C10M *1/06*

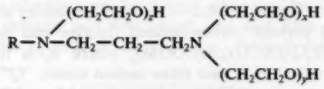
U.S. Cl. 252—49.3 **12 Claims**

1. A liquid composition useful as a low smoking metalworking liquid comprising:

a. about 20–40 parts by weight of a block copolymer having a central portion of polypropylene oxide with polyethylene oxide on each end and the copolymer having a molecular weight of from about 1800 to 2900;

b. about 10–30 parts by volume of a sulfo-chlorinated fatty acid containing about 0.5 to 1.5 parts by weight of sulfur and about 4 to 7 parts by weight of chlorine;

c. about 1–10 parts by volume of a compound having the following structure:



wherein R is a C_{10}–C_{20} aliphatic group derived from tallow and the total value of *z*, *x* and *y* is such that the compound is water soluble;

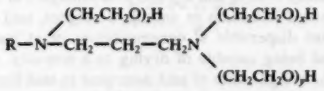
d. amounts of potassium hydroxide, water and defoaming agent sufficient to make the liquid useful as a metal-working liquid.

7. In a method of cold working a metal piece the improvement of applying to the metal being cold worked a liquid comprising:

a. about 20–40 parts by weight of a block copolymer having a central portion of polypropylene oxide with polyethylene oxide on each end and having a molecular weight of from about 1800 to 2900;

b. about 10–30 parts by volume of a sulfo-chlorinated fatty acid containing about 0.5 to 1.5 parts by weight of sulfur, about 4 to 7 parts by weight of chlorine;

c. about 1–10 parts by volume of a compound having the following structure:



wherein R is a C_{10}–C_{20} aliphatic group and the total value of *z*, *x* and *y* is such that the compound is water soluble;

d. amounts of potassium hydroxide, water and defoaming agent sufficient to make the liquid useful as a metal-working liquid.

4,043,926
LUBRICANT COMPOSITION

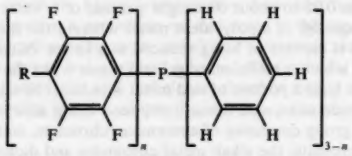
Carl E. Snyder, Jr., Trotwood, and Christ Tamborski, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 629,469, Nov. 6, 1975. This application Apr. 30, 1976, Ser. No. 681,871

Int. Cl.[2] C10M *3/24*

U.S. Cl. 252—49.9 **11 Claims**

1. A lubricant composition comprising (1) a perfluorinated polyalkylether base fluid and (2) a corrosion inhibiting amount of a phosphine compound having the following formula:



where one of the R's is a perfluoroalkylether group, two of the R's are fluorine, and *n* is 1, 2 or 3.

4,043,927
FRICTION OR TRACTIVE DRIVE CONTAINING ETHERS OF ADAMANTANES

Irl N. Duling, West Chester; David S. Gates, Swarthmore; Frederick P. Glazier, Thornton, all of Pa., and Robert E. Moore, Wilmington, Del., assignors to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 232,510, March 7, 1972, abandoned. This application Dec. 15, 1975, Ser. No. 641,110

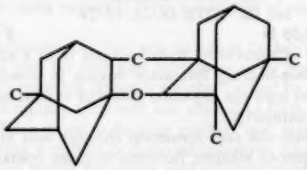
The portion of the term of this patent subsequent to Mar. 14, 1989, has been disclaimed.

Int. Cl.[2] C10M *1/20*

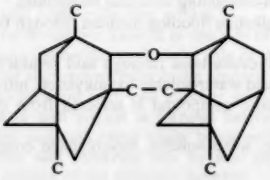
U.S. Cl. 252—52 R **6 Claims**

1. A method of improving the coefficient of traction between relatively rotatable members of torque transmitting relationship which comprises introducing to the surfaces of said members at least one adamantane compound having a structure corresponding to one of the following formulae: II, VI, VII and VIII.

II

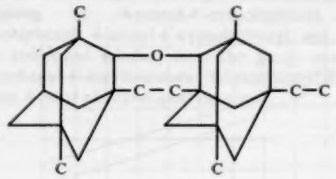


VI

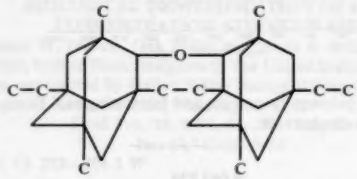


-continued

VII



VIII



4. A method according to claim 1 wherein said tractant comprises from 5–95 parts by volume of one or more of said ethers and from 95–5% of an acyclic branched chain fluid polymer or hydrogenated polymer of a C_3–C_8 mono-olefin, said fluid polymer having an SUS viscosity at 100° F. in the range of 20–2,000 SUS, and an ASTM viscosity index in the range of 30–160.

4,043,928

SERUM SEPARATING COMPOSITION OF MATTER

Michel J. Lukacs, Goshen, N.Y., and Ian H. Jacoby, Franklin Lakes, N.J., assignors to Lukacs and Jacoby Associates, Middletown, N.Y.

Filed Oct. 31, 1973, Ser. No. 411,239
Int. Cl.[2] B29F *3/00*; C09K *3/00*
U.S. Cl. 252—60 **4 Claims**

1. A sealant adapted to be used in a method of separating a sample of whole blood into serum and clot portions by centrifuging wherein said sealant forms a separator between said portions, whereby the serum may be removed without disturbing the clot, said sealant consisting essentially of:

a. a major amount of a silicone liquid; and

b. a minor amount of an inert filler dispersed within said silicone liquid, said inert filler being used in an amount sufficient to set the specific gravity of said sealant in the range of 1.026 to 1.092, said sealant being thixotropic, water insoluble, substantially non-toxic and substantially chemically inert with respect to the constituents of the blood sample.

4,043,929

ELECTROSTATOGRAPHIC CARRIER COMPOSITION

Harry W. Gibson, Penfield, and Franklin D. Saeva, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 26, 1974, Ser. No. 500,775
Int. Cl.[2] G03G *9/00*
U.S. Cl. 252—62.1 R **9 Claims**

1. An electrostatographic carrier composition for use in developing electrostatic latent images on a recording surface, said carrier composition comprising carrier particles having an average particle diameter of between about 50 microns and about 1,000 microns, each of said carrier particles comprising a core surrounded by an outer coating of a polymer containing hydroxyl moieties, said polymer having been selected from the group consisting of styrene-alkylmethacrylates and styrene-alkylacrylates wherein said polymer has been exposed to systematic chemical alteration of said hydroxyl moieties by silylation to provide carrier particles characterized as having controlled triboelectric charging properties.

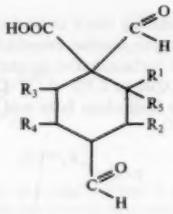
4,043,930

1,4-BIS-FORMYL CYCLOHEXANE POLYCARBOXYLIC ACIDS, PROCESS OF MAKING SAME, AND COMPOSITIONS AND METHODS OF USING SAME

Friedrich Krueger, Edingen, and Dieter Palleduhn, Mannheim, both of Germany, assignors to Joh. A. Benckiser GmbH, Ludwigshafen (Rhine), Germany

Filed July 9, 1975, Ser. No. 594,259
Claims priority, application Germany, July 9, 1974, 2432832
Int. Cl.[2] C11D *1/00*; C02B *1/18, 5/06*; C07C *53/00*
U.S. Cl. 252—89 R **11 Claims**

1. A 1,4-bis-formyl cyclohexane polycarboxylic acid of the Formula

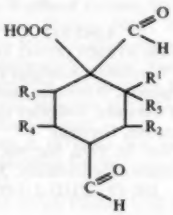


in which

R_1, R_2, R_3, and R_4 are hydrogen or the carboxyl group, at least one of the substituents R_1, R_2, R_3, and R_4 being a carboxyl group, and

R_5 is hydrogen or the methylene carboxyl group (—CH_2—COOH).

11. In a process of producing a 1,4-bis-formyl cyclohexane polycarboxylic acid of the Formula

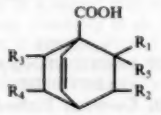


in which

R_1, R_2, R_3, and R_4 are hydrogen or the carboxyl group, at least one of the substituents R_1, R_2, R_3, and R_4 being a carboxyl group, and

R_5 is hydrogen or the methylene carboxyl group (—CH_2—COOH),

said process comprising the steps of oxidizing a compound of the Formula



in which

R_1, R_2, R_3, and R_4 are hydrogen or the carboxyl group and at least one of the substituents R_1, R_2, R_3, and R_4 being a carboxyl group, and

R_5 is hydrogen or the methylene carboxyl group (—CH_2—COOH),

or the anhydride of said compound with two neighboring

carboxyl groups being present in the form of their anhydride, said oxidation being effected by heating said compound with 40% to 68% nitric acid at a temperature between 60° and 100° C. in the absence of a catalyst so as to yield said 1,4-bis-formyl cyclohexane polycarboxylic acid.

4,043,931

LAVATORY CLEANSING BLOCK

Daniel John Jeffrey, East Harling, and Keith Charles Gingell, Roydon, near Diss, both of England, assignors to Jeyes Group Limited, Thetford, England

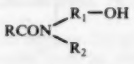
Filed Feb. 19, 1974, Ser. No. 443,529

Claims priority, application United Kingdom, Feb. 26, 1973, 9329/73

Int. Cl.² C11D *1/10, 1/48*

U.S. Cl. 252—93 **7 Claims**

1. A lavatory cleansing block comprising at least 35% of a solid carrier base which consists essentially of a mixture of at least two non-ionic surface active agents, one of which has a water solubility of 0.01 to 0.5% at 20° C. and is a mono- or dialkanolamide of a long chain fatty acid of the formula:



in which R is a long chain aliphatic group of from 8-24 C atoms, R_1 is a lower alkylene group and R_2 is a hydrogen atom or R'OH and the other of which has a water solubility of 1-100 at 20° C., the degree of release of components from the block being to a large extent controlled by the relative properties of relatively soluble and relatively insoluble non-ionic surface active components.

4,043,932

WATER STERILIZING AGENT

Wilhelm Fresenius, Wiesbaden; Remigius Fresenius, Heidenrod-Zorn; Ludwig Fresenius, Wiesbaden, and Wilhelm Schneider, Heidenrod, all of Germany, assignors to Erfindergesellschaft Fresenius, Taunusstein, Germany

Filed Nov. 21, 1975, Ser. No. 633,963

Claims priority, application Germany, July 9, 1975, 2530487

Int. Cl.² E11D *3/395*

U.S. Cl. 252—95 **5 Claims**

1. a dry, light-resistant, silver-based composition for sterilizing water, consisting essentially of (1) a sodium-silver-chloride complex, (2) an excess of sodium chloride, the mol ratio of the complex bound silver to the total amount of complex bound and free sodium chloride being 1:10 to 1:10,000, (3) 30 to 95% by weight of the composition of an alkali hydrogen carbonate as a buffer and (4) 0.1-5% by weight of the composition of calcium hypochlorite capable of splitting off chlorine.

4,043,933

METHOD OF FABRICATING A FUEL CELL ELECTRODE

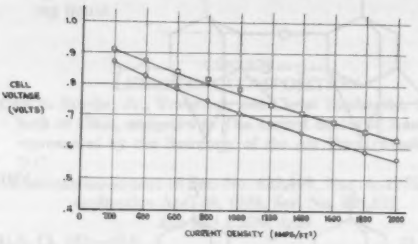
Richard D. Breault, Coventry; Richard P. Harding, South Windsor, and Fred S. Kemp, Ellington, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed June 15, 1976, Ser. No. 696,335

Int. Cl.² H01M *4/04*

U.S. Cl. 252—182 **11 Claims**

1. The method of constructing a stabilized fuel cell electrode comprising the steps of forming a uniform aqueous suspension of electrocatalyst particles and hydrophobic polymer particles; adjusting the pH of said suspension to a range of from pH 1.5 to pH 6, or from a range of pH 10 to pH 12 to form an electrocatalyst/polymer flocculate; and fabricating said flocculate into a fuel cell electrode.



4,043,934

CATALYST AND METHOD FOR OXIDIZING REDUCING GASES

Kurt E. Shuler, Rancho Santa Fe, and Gerhard N. Schrauzer, La Jolla, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 491,338, July 24, 1974, abandoned, and Ser. No. 491,464, July 24, 1974, abandoned. This application Mar. 31, 1975, Ser. No. 563,841

Int. Cl.² B01D *53/34;* **C10K** *1/26*

U.S. Cl. 252—186 **11 Claims**

1. A reagent which is self-regenerating in air, and which, on contact with a reducing gas, oxidizes the gas and is reduced from an oxidized state to a reduced state, the reagent comprising a mixture of a palladium salt, a compound which includes a complex ion of a metal selected from the group consisting of molybdenum, tungsten and vanadium, and a salt of a metal selected from the group consisting of copper, nickel and iron, said salt being present in an amount sufficient to cause the reagent to oxidize from the reduced state caused by contact with the reducing gas to the oxidized state in the presence of air and absence of the reducing gas, and a hydrophilic carrier for the mixture.

4,043,935

LIQUID CRYSTAL COMPOSITION HAVING HIGH DIELECTRIC ANISOTROPY AND DISPLAY DEVICE INCORPORATING SAME

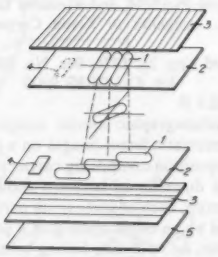
Sadao Kanbe, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed July 3, 1974, Ser. No. 485,673

Claims priority, application Japan, July 6, 1973, 48-75765

Int. Cl.² C09K *3/34;* **G02F** *1/13*

U.S. Cl. 252—299 **8 Claims**



1. A liquid crystal display device including a liquid crystal cell, a nematic liquid crystal composition of positive dielectric

anisotropy therein, said cell being constructed for operation in the Field-Effect Mode, said liquid crystal composition consisting of at least one biphenyl compound selected from the group consisting of 4-pentyl-4'-cyanobiphenyl, 4-hexyl-4'-cyanobiphenyl, 4-heptyl-4'-cyanobiphenyl and at least one ester compound selected from the group consisting of 4-cyanophenyl-4'-butylbenzoate, 4-cyanophenyl-4'-hexylbenzoate and 4-butyl-phenyl-4'-pentylbenzoate.

4,043,936

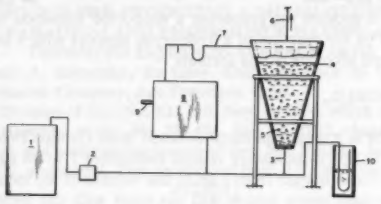
BIOLOGICAL DENITRIFICATION OF HIGH CONCENTRATION NITRATE WASTE

Chester W. Francis, Oak Ridge, and Frank S. Brinkley, Knoxville, both of Tenn., assignors to The United States of America as represented by United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 24, 1976, Ser. No. 660,903

Int. Cl.[2] G21F *9/18*

U.S. Cl. 252—301.1 W **10 Claims**



1. A process for removing nitrate ions from an aqueous waste stream having a nitrate concentration in excess of one kilogram nitrate per cubic meter, comprising the steps of:

incubating under anaerobic conditions a culture of mixed denitrifying bacteria in the presence of a solution comprising at least 750 grams of nitrate per cubic meter and a biologically effective amount of a first carbon source to produce a culture of incubated mixed denitrifying bacteria;

mixing said waste stream with a second source of carbon to form an influent solution;

passing said influent solution vertically upward through a packed concially shaped column having as a packing material a support for denitrifying bacteria and having said incubated mixed denitrifying bacteria attached thereto; said conically shaped column having an upper diameter larger than its lower diameter;

allowing said influent solution to contact said packing whereby said nitrate ions and said carbon source are converted to carbon dioxide and elemental nitrogen by the incubated denitrifying bacteria; and

separating said elemental nitrogen from the influent solution.

4,043,937

HALOGEN DERIVATIVES OF ASCORBIC ACID AND D-ARABOASCORBIC ACID ANTIOXIDANTS

Joseph Kiss, Arlesheim, Switzerland, and Klaus Peter Berg, Grenzach-Wylen, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

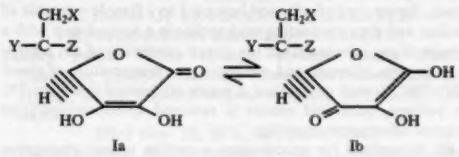
Filed Apr. 28, 1976, Ser. No. 681,083

Claims priority, application Switzerland, May 3, 1975, 5741/75

Int. Cl.[2] C07D *307/32*

U.S. Cl. 252—407 **9 Claims**

1. A compound of the tautomeric formulae

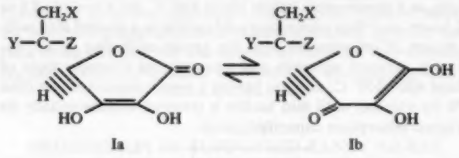


Ia Ib

wherein X is halogen; and one of Y and Z is hydrogen, and the other is hydroxy; with the proviso that when Y is hydroxy and Z is hydrogen, X is chlorine or bromine;

a salt of these compounds.

6. Process for stabilizing oxidation-sensitive organic materials comprising incorporating in said material a stabilizing amount of a compound of the tautomeric formula:



Ia Ib

wherein X is halogen; and one of Y and Z is hydrogen and the other is hydroxy; with the proviso that when Y is hydroxy and Z is hydrogen, X is chlorine or bromine;

or with a salt thereof.

4,043,938

METHODS FOR REACTIVATING ZEOLITES

Hans-Heinrich Reif; Klaus Wehner, both of Leuna; Jürgen Welker, Halle-Neustadt; Karl-Heinz Schmidt, Leuna; Waltraud Schnick; Lutz Widmann, both of Halle-Neustadt; Otto Schicker, Merseburg-Sud; Gunter Seidel, Leuna; Karsten Kalb, Weissenfels; Wolfhard Dollase, Bad Durrenberg; Helmut Fürtig, Jessnitz; Werner Höse, Dresden; Wolfgang Roscher, Halle; Udo Hädicke; Herbert Knoll, both of Dessau; Rüdiger Seidel, Sandersdorf; Gunter Nemitz, Wolfen; Edith Stürmer, Bad Durrenberg, and Manfred Kaiser, Berlin-Karlshorst, all of Germany, assignors to VEB Leuna-Werke "Walter Ulbricht", Leuna, Germany

Filed Feb. 3, 1975, Ser. No. 546,244

Claims priority, application Germany, June 24, 1974, 179392; June 24, 1974, 179393

Int. Cl.[2] B01J *29/38;* C10G *25/12;* C07C *7/12*

U.S. Cl. 252—412 **16 Claims**

1. A method for reactivating a zeolite whose absorptive capacity has been deactivated in a process of separating normal paraffins from a hydrocarbon mixture containing said paraffins by means of alternating adsorption onto said zeolite and desorption therefrom with water-containing ammonia vapor; which method comprises a first step of contacting said zeolite directly after said desorption step with water, or water-containing gases at a temperature of about 20°–250° C, the proportion by weight of water to zeolite being at least 1:10, and then contacting said zeolite in a second step with a stream of gas selected from the group consisting of air, hydrogen, oxygen, nitrogen and ammonia, at a temperature of about 400°–550° C, said gas having a water content of less than 5% by volume, until said zeolite is restored to substantially its original adsorption capacity.

7. A method for reactivating a zeolite whose absorptive capacity has been deactivated in a process of separating normal paraffins from a hydrocarbon mixture containing said paraffins by means of alternating adsorption onto said zeolite and desorption therefrom with water-containing ammonia vapor; which method comprises a first step of contacting said zeolite directly after said desorption step with an aqueous solution of a salt of the bivalent metal of group IIA of the periodic system

at a temperature below about 100° C, for a period of 1 to 72 hours, the amount of salt used being 0.1 to 1.0 mole per mole of zeolite; and then contacting said zeolite in a second step with a stream of gas selected from the group consisting of air, hydrogen, oxygen, nitrogen and ammonia, at a temperature of about 400°–550° C, said gas having a water content of less than 5% by volume, until said zeolite is restored to substantially its original adsorption capacity.

10. A method for reactivating a zeolite whose absorptive capacity has been deactivated in a process of separating normal paraffins from a hydrocarbon mixture containing said paraffins by means of alternating adsorption onto said zeolite and desorption therefrom with water-containing ammonia vapor; which method comprises a first step of contacting said zeolite directly after said desorption step with an aqueous solution of a substance selected from the class consisting of urea and a nitrogen compound having the formula $NR_1R_2R_3$, wherein R_1 and R_2 are independently H, CH_3 or C_2H_5 and R_3 is CH_3 or C_2H_5, at a temperature below about 150° C, for a period of 1 to 72 hours, and then contacting said zeolite in a second step with a stream of gas selected from the group consisting of air, hydrogen, oxygen, nitrogen and ammonia, at a temperature of about 400°–550° C, said gas having a water content of less than 5% by volume, until said zeolite is restored to substantially its original adsorption capacity.

4,043,939

REACTIVATION OF CATALYSTS USEFUL FOR NITROGEN OXIDE REMOVAL

Shigeaki Kasaoka, Okayama, Japan, assignor to Kurashiki Boseki Kabushiki Kaisha, Kurashiki, Japan

Filed Oct. 10, 1975, Ser. No. 621,434
Int. Cl.[2] B01J *23/94, 23/96, 23/92, 21/20*
U.S. Cl. 252—416 **4 Claims**

1. A method of regenerating a catalyst which removes nitrogen oxides from exhaust gas in the presence of ammonia, which catalyst comprises copper, iron, cobalt, chromium, nickel, manganese, titanium, vanadium, molybedenum, silver, platinum, rhodium or palladium supported on an alumina, silica-alumina, magnesia-alumina, titania-alumina, calcium oxide alumina, chromium oxide-alumina, or chromium oxide alumina carrier, which catalyst has been employed to remove nitrogen oxides from exhaust gas in the presence of ammonia, and which is inactivated by the presence of sulfur oxides in the exhaust gas which method comprises calcining said catalyst in substantially the atmosphere at a temperature in the range of from about 700° to 1200° C thereby restoring the initial nitrogen oxide removing activity of said catalyst.

3. A method, as in claim **1,** of regenerating a catalyst comprising copper.

4,043,940

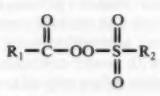
LIQUID ACYL SULFONYL PEROXIDE FORMULATIONS DERIVED FROM SOLID ACYL ALKYLSULFONYL PEROXIDES

Jose Sanchez, Grand Island, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed July 15, 1975, Ser. No. 596,115
Int. Cl.[2] C08F *4/34;* **C07C** *179/06*
U.S. Cl. 252—426 **18 Claims**

1. A liquid solution composition which is a storable stable liquid at 0° to −40° C consisting essentially of

a. 10 to 70% by weight of a solid acyl alkylsulfonyl peroxide with a melting point between −10° and 70° C having the formula



where

1. R_1 is an alkyl of 1 to 4 carbons and
2. R_2 is selected from the group consisting of an alkyl or monochloroalkyl radical of 3 to 18 carbons and a cycloalkyl or cyclomonochloroalkyl radical of 4 to 12 carbons, and

b. 90 to 30% by weight of a solvent or solvent system having a complete solidification temperature below about −10° C and a miscibility number of greater than 8 and less than 21, which solvent or solvent system possesses at least about 20% by weight based on the solid acyl sulfonyl peroxide of a solvent which has a boiling point of at least 165° C at 760 torr.

4,043,941

SUPPORTED TRANSITION METAL CATALYSTS AND PROCESS FOR THEIR PREPARATION

John F. White, and Jerome C. Bertrand, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed Nov. 26, 1975, Ser. No. 635,467
Int. Cl.[2] B01J *31/02*
U.S. Cl. 252—430 **28 Claims**

1. In a process for preparing a supported transition metal catalyst by the reaction of a hydroxylic support with a transition metal alkoxide of the formula

$$M(OR)_nQ_m$$

where M is a transition metal selected from Groups IVb, Vb and VIB, OR is an alkoxy radical containing 1 to 18 carbon atoms, *n* is an integer from 2 up to the valence of the metal M, Q is an inert group which will not react with the hydroxyl groups of the support, the alkoxide radical OR or alcohol ROH formed therefrom and *m* is an integer so that n + m statisfies the valence of the metal M, to obtain a free-flowing, hydrolytically stable catalyst having superior activity and having the transition metal bound to the surface thereof, the improvement consisting essentially of: heating the support and an excess of transition metal alkoxide, based on the available surface hydroxyl groups, in an inert hydrocarbon in the presence of water at a temperature in the range 100°–300° C to effect condensation of the transition metal alkoxide and reaction of the transition metal alkoxide or oligomer thereof with the surface hydroxyl groups.

4,043,942

MODIFIED NICKEL CATALYST SYSTEMS AND THEIR USE IN REDUCTIVE ALKYLATION REACTIONS

Farris H. Wilson, Jr., Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 876,174, Dec. 3, 1969, Pat. No. 3,739,026, which is a continuation of Ser. No. 606,010, Dec. 30, 1966, abandoned. This application Mar. 15, 1973, Ser. No. 341,411
Int. Cl.[2] B01J *31/02*
U.S. Cl. 252—430 **6 Claims**

1. A catalytic system comprising (a) a nickel catalyst, (b) at least one acid selected from the group consisting of sulfur-free acids and sulfur-containing acids in which the sulfur is in the form of a

radical and (c) at least one sulfur-containing material selected from the group consisting of sulfur and a sulfur-containing compound at least a portion of said sulfur being in the form of at least one radical selected from the group consisting of — S — and

3. A catalytic system according to claim 1 wherein the acid is selected from the group consisting of acidic acid, oxalic acid, toluene sulfonic acid, sulfuric acid, hydrochloric acid and oleic acid wherein the sulfur-containing material is selected from the group consisting of thiodipropionic acid, xylene monosulfide, thioanisole, thiodipropionitrile, benzothiazole, mercaptobenzothiazole, di-tert.butylsulfide, benzothiazole monosulfide, S-alkyl (C-6) mercapto propionic acid, dimethyl sulfoxide, tetramethyl thiuram monosulfide, sulfur, di-iso-octyl thio dipropionic acid, beta-mercapto propionic acid, dithiodibenzoic acid, tetramethyl thiuram disulfide, n-butyl sulfoxide, thiobenzoic acid, thiourea, dithiobenzoic acid, thiomalic acid, benzothiazole disulfide, 4-methyl-thiophenol, benzyl disulfide, morpholine disulfide and sodium sulfide.

4,043,943

PROCESS FOR PRODUCING A MIXED OXIDE OF VANADIUM AND PHOSPHORUS HAVING AN IMPROVED INTRINSIC SURFACE AREA

Ronald A. Schneider, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 521,428, Nov. 6, 1974, which is a continuation of Ser. No. 274,685, July 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 263,883, June 19, 1972, abandoned. This application Sept. 12, 1975, Ser. No. 612,823

Int. Cl.[2] B01J *27/14*

U.S. Cl. 252—437 **2 Claims**

1. A process for preparing a catalyst for catalayzing maleic anhydride production by oxidation of a hydrocarbon and which has an intrinsic surface area in excess of 5 m^2/g, which preparation process comprises:

a. forming a solution containing a vanadium compound and a phosphorus compound in an organic liquid medium, the medium containing less than 20 volume percent water and at least 15 volume percent oxygen-containing organic compounds selected from the group consisting of alcohols, carboxylic acids, ethers, esters, amides, and ketones, said medium and said vanadium and phosphorus compounds being effective so as to form a vanadium phosphate compound wherein the average valence of vanadium is between +3.8 and +4.6;

b. precipitating said vanadium phosphate compound in said solution;

c. removing liquid medium from the solution to obtain said vanadium phosphate compound; and

d. calcining the vanadium phosphate compound to obtain said catalyst having an intrinsic surface area in excess of 5 m^2/g.

4,043,944

CATALYSTS FOR HYDROCARBON CONVERSION

Bernard Juguin, Rueil-Malmaison; Jean Cosyns, Nanterre; Jean-Francois Le Page, Rueil-Malmaison, and Jean Miquel, Paris, all of France, assignors to Societe Francaise des Produits pour Catalyse, Rueil-Malmaison, France

Filed Oct. 7, 1975, Ser. No. 620,410

Claims priority, application France, Oct. 11, 1974, 74.34392

Int. Cl.[2] B01J *23/38, 21/00, 23/62;* **C10G** *35/06*

U.S. Cl. 252—441 **12 Claims**

1. A catalyst consisting essentially of (a) a carrier and, expressed in proportion by weight with respect to the carrier, (b) 0.005 to 2% of platinum, (c) 0.005 to 1% of a metal selected from the group consisting of iridium, rhodium and ruthenium, (d) 0.05 to 0.8% of cobalt, 0.005 to 1% of at least one metal selected from the group consisting of copper, manganese, silver and gold, and (f) 0.1 to 10% of at least one halogen.

4,043,945

METHOD OF PRODUCING THIN LAYER METHANATION REACTION CATALYST

Yutaka Fukui; Fumio Hataya; Ryoichi Sasaki; Fumito Nakajima; Shimpei Matsuda; Munehiko Tonami, and Ryo Hiraga, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 11, 1975, Ser. No. 630,881

Claims priority, application Japan, Nov. 11, 1974, 49-128993

Int. Cl.[2] B01J *21/04, 23/74*

U.S. Cl. 252—466 J **12 Claims**

1. A method of producing a methanation reaction catalyst comprising forming an aluminum diffusion layer on the inner surface of a tube of an alloy containing at least 45% by weight nickel and having a tensile strength of at least 35 kg/mm^2 and an elongation of at least 20% at 500° C. by heating said tube together with a powdery pack comprising an aluminum powder in an amount of 1 to 50 percent by weight, ammonium chloride as an active agent and a heat-resistant inactive carrier for preventing agglomeration of said aluminum powder, said pack being charged into the interior of said tube, and developing said aluminum diffusion layer with an alkaline solution.

4,043,946

PRODUCTION OF SUPPORTED RANEY NICKEL CATALYSTS BY REACTIVE DIFFUSION

Philip E. Sanker; Laurance L. Oden, both of Albany, and James H. Russell, Corvallis, all of Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed July 30, 1976, Ser. No. 709,990

Int. Cl.[2] B01J *21/04, 23/74*

U.S. Cl. 252—466 J **7 Claims**

1. A method for producing a Raney nickel catalyst which comprises:

placing a nickel substrate within a mold cavity in a casting mold, the edge of the cavity being spaced about 0.5 to about 1.3 mm from the nickel substrate surface;

heating the mold to a temperature of from about 950° C to about 1,050° C in a heating zone;

pouring into said mold cavity molten aluminum heated to a temperature of about 700° to about 900° C to fill said cavity whereby the molten aluminum contacts the nickel substrate;

continuing heating said mold in the heating zone for about 30 seconds after the pouring of the aluminum is completed;

removing the mold from the heating zone;

allowing the mold to cool to ambient temperature;

removing from the mold a structure comprising a nickel substrate, a Ni_2Al_3 intermediate layer and a $NiAl_3$ face; and leaching said structure with alkali metal caustic solution to form a Raney nickel catalyst.

4,043,947

IMPACT IMPROVEMENT OF RUBBER-MODIFIED NITRILE RESINS

Herbert Talsma, East Cleveland, and William M. Giffen, Jr., Aurora, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Jan. 15, 1976, Ser. No. 649,223

Int. Cl.[2] C08K *5/04, 5/09, 5/13, 5/53*

U.S. Cl. 260—23.7 M **12 Claims**

1. An impact-resistant resin composition comprising an intimate mixture of from 1 to 30 parts by weight of an impact improver selected from the group consisting of triethyl phosphate, 2-ethyl hexanoic acid, 2,4-di-t-butyl phenol, trimethyl phosphate, tributyl phosphate, 4-hexyl resorcinol, epoxidized soybean oil, 2,6-di-t-butyl-4-methyl phenol, and p-nonyl phenol and 100 parts by weight of a resin resulting from the polymerization of a major proportion of an unsaturated nitrile in the presence of a preformed rubber component and optionally

a minor proportion of at least one other polymerizable component.

4,043,948

INSOLUBLE POLYALKYL PHOSPHONIUM SALT RESINS HAVING CARBON-CARBON CROSSLINKED BACKBONE

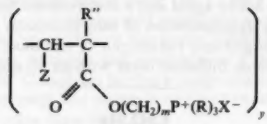
Joseph W. Rakshys, Jr., Midland, Mich., and Suzanne V. McKinley, Wellesley, Mass., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 390,830, Aug. 23, 1973, abandoned. This application Aug. 6, 1975, Ser. No. 602,337

Int. Cl.[2] **C08F** *230/00, 210/00;* **C08L** *23/32;* **C08F** *230/02*

U.S. Cl. 260—2.1 E **13 Claims**

1. An insoluble polymer having a carbon to carbon crosslinked backbone, said polymer having a plurality



groups where R″ is H or a methyl group, R is a saturated unsubstituted aliphatic hydrocarbon group having from 1 to 10 C atoms, X is an OH^- or an OR‴ group where R‴ is a hydrocarbyl group of 1 to 10 C atoms free of aliphatic unsaturation, a CN^-, NO_3^-, $SO_4^=$, or a ClO_4^- group, *m* is an integer from 1 to 6 and Z is H or a CO_2R''' group, having R″ as defined, or a $(CH_2)_mP^+(R)_3X^-$ group, as defined, and constitutes from 20 to 99 mole percent of the polymer, from about 0.1 to about 30 mole percent being derived from a polyolefinic monomer and the remainder being derived from a mono-olefinic monomer.

4,043,949

OXIDATIVE STABILITY OF FLEXIBLE POLYURETHANE FOAMS

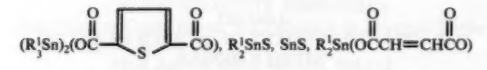
Kenneth Treadwell, Rahway; Bernard G. Kushlefsky, Edison, both of N.J., and Robert V. Russo, Brooklyn, N.Y., assignors to M&T Chemicals Inc., Greenwich, Conn.

Filed Mar. 6, 1975, Ser. No. 556,011

Int. Cl.[2] **C08G** *18/18, 18/14, 18/24*

U.S. Cl. 260—2.5 AC **5 Claims**

1. In a method for improving the oxidative stability of flexible cellular polyurethanes prepared by reacting a polyol containing at least two active hydrogen atoms per molecule, as determined by the Zerewitinoff method, with a stoichiometric excess of a polyfunctional isocyanate, the reaction being conducted in the presence of water as a blowing agent, at least one tertiary amine blowing catalyst, and effective amount of a gel catalyst of the formula R_aSnX_4-a, $(R_3^1Sn)_2S$,



wherein X is a monovalent radical selected from the group consisting of

chlorine and bromine, R^2 and R^3 each represents an alkyl radical containing between 1 and 20 carbon atoms, a cycloalkyl, phenylalkyl, alkylphenyl or a phenyl radical, R^4 represents an alkyl radical containing between 1 and 20 carbon atoms, a cycloalkyl, phenyl or a substituted phenyl radical, a represents the integer 1, 2 or 3 and *n* represents an integer between 1 and 12, inclusive, the improvement consisting essentially of employing a gel catalyst wherein R^1 is selected from the group consisting of methyl, allyl, phenyl, and substituted phenyl.

4,043,950

PROCESS FOR THE MANUFACTURE OF PLASTIC FOAMS AND FLAME-PROOFING FOAMS CHARACTERIZED BY THE USE OF A CARRIER FOAM

Hans Wilmsen, deceased, late of Essen, Germany, by Joerg Michael Wilmsen, sole heir, 243 Alfredstrasse, 4300 Essen, Germany

Continuation of Ser. No. 500,722, Aug. 26, 1974, abandoned. This application May 3, 1976, Ser. No. 682,254

Claims priority, application Switzerland, Aug. 27, 1973, 12235/73

Int. Cl.[2] **C08J** *9/16;* **C08L** *5/02, 61/24*

U.S. Cl. 260—2.5 F **16 Claims**

1. Process for the manufacture of plastic foams and flame-proofing foams based on aqueous and/or aqueous alcoholic synthetic resins, in which the synthetic resin is foamed up by means of foaming agents and compressed gas and is subsequently cured, if appropriate using catalysts and/or reducing agents and/or oxidizing agents, and the chemical and/or the mechanical and/or the physical properties of the known foams and/or new foams are improved by new reaction systems and/or additives, characterised in that a carrier foam of urea-formaldehyde resin or a carrier foam containing urea-formaldehyde resin and at least one member from the group consisting of:

a. furan resin,

b. furan resin co-condensate,

c. polyester resin, epoxy resin polyurethane, acrylic resin, alkyd, phenoplast resin or aminoplast resin,

is formed, the carrier foam being rapid curing, and (2) further solid and/or liquid additives are mixed into the finished but not yet cured carrier foam in one or more subsequent mixing chambers.

4,043,951

ACRYLONITRILE-CAPPED POLYETHER-SILOXANE

Bela Prokai, Mahopac, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,251

Int. Cl.[2] **C08J** *9/00*

U.S. Cl. 260—2.5 AH **37 Claims**

1. An acrylonitrile-capped polyoxyalkylene-polysiloxane polymer containing at least one silicon-bonded acrylonitrile-capped polyoxyalkylene radical having the average formula $—R''(X)_q(OC_3H_6)_n(OC_2H_4)_mOCH_2CH_2CN$ wherein R″ is an alkylene radical, free from unsaturation, and containing from 2 to 6 carbon atoms, wherein X is a bridging group selected from the class consisting of —CO— and —NHCO—, wherein *q* has a value of 0 or 1, wherein *m* has a value of from 4 to 30 and wherein *n* has a value of from 0 to 10.

4,043,952

SURFACE TREATMENT PROCESS FOR IMPROVING DISPERSIBILITY OF AN ABSORBENT COMPOSITION, AND PRODUCT THEREOF

Stuart H. Ganslaw, Piscataway, and Howard G. Katz, East Windsor, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed May 9, 1975, Ser. No. 576,132

Int. Cl.[2] **C08L** *3/04*

U.S. Cl. 260—17.4 ST **19 Claims**

1. A process for surface treating a water-absorbent composi-

tion of matter to improve its aqueous dispersibility comprising the steps of

A. forming a dispersion comprising (i) a water-absorbent composition of matter based on an anionic poly-electrolyte, (ii) polyvalent, cations of at least one metal, and (iii) a dispersing medium in which said composition of matter is substantially insoluble;

B. maintaining said dispersion at a temperature of about −40° to about +150° C for a period of time sufficient for said cations to ionically complex the outer surface of said composition of matter exposed to said dispersing medium; and

C. removing said dispersing medium.

4,043,953

AMBIENT TEMPERATURE, MOISTURE-CURABLE ACRYLIC-SILANE COATING COMPOSITIONS HAVING IMPROVED POTLIFE

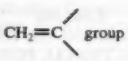
Wen-Hsuan Chang, Gibsonia; Marvis E. Hartman, Pittsburgh, and Roger L. Scriven, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 2, 1975, Ser. No. 574,194
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—18 S **24 Claims**

1. In an ambient temperature, moisture-curable coating composition which includes:

A. an acrylic-silane interpolymer of:

1. at least one ethylenically unsaturated monomer which contains



group and is devoid of active hydrogen atoms; and

2. a copolymerizable organoalkoxysilane selected from the group consistng of acrylatoalkoxysilanes, methacrylatoalkoxysilanes and vinylalkoxysilanes; and

B. a cure accelerating catalyst; the improvement which comprises the addition of:

C. from about 0.5 percent to about 15 percent by weight of interpolymer solids of a monomeric hydrolytically reactive organosilicon stabilizer represented by the formula:

$$X_nSi(OR)_{4-n}$$

wherein X is an organic radical having from 1 to 12 carbon atoms, R may be methyl, ethyl, 2-methoxymethyl, 2-ethoxyethyl or an acyl group containing 5 or less carbon atoms and *n* is 0, 1 or 2.

4,043,954

COMPOSITIONS AND LAMINATES MADE THEREFROM

LeRoy A. Claybaker, Coshocton, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 27, 1975, Ser. No. 562,526
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—19 A **8 Claims**

1. In the process of preparing an oil-modified resole by (a) reacting a phenol moiety with tung oil in the presence of strong acid and (b) reacting the product of (a) in an alcohol solvent with an aldehyde moiety in the presence of an amine catalyst, the improvement which consists of using as the alcohol solvent a mixture consisting of, by weight, from 15 to 50 percent methyl alcohol and 85 to 50 percent isopropyl alcohol.

4,043,955

CONTINUOUS METHOD OF AGGLOMERATING AQUEOUS LATICES

Mark D. Paster, Worthington, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Feb. 20, 1975, Ser. No. 551,791
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—23.7 A **31 Claims**

1. An improved process for agglomerating polymer particles in an aqueous latex, with a water soluble organic acid anhydride, the improvement comprising:

A. feeding continuously into a mixing zone an aqueous solution of a water soluble organic acid anhydride, while simultaneously feeding continuously into said mixing zone an aqueous latex of a low heat distortion polymer, said polymer being a diene rubber polymer, the particles of said polymer being small and adherent upon collision and said latex containing an emulsifying agent, which is a salt of an organic acid with an ionization constant lower than that of the acid of the anhydride;

B. mixing continuously said solution of said water soluble organic acid anhydride with said latex in said mixing zone forming an admixture;

C. passing continuously said admixture from said mixing zone through a perforated member forming a wall section of said mixing zone into an interconnected conduit;

D. flowing continuously, said admixture under laminar flow, induced by said perforated member, through said conduit wherein said admixture has a passage-time through said conduit sufficient to hydrolyze the acid anhydride, agglomerating the particles of the polymer to a predetermined size, forming an agglomerated admixture;

E. moving continuously said agglomerated admixture from said conduit through a low-shear zone being interconnected at one end portion to said conduit and having a withdrawal port at an opposite end portion;

F. stabilizing continuously said agglomerated admixture moving through said low-shear zone by adding an emulsifying material selected from the group consisting of an acid-stable emulsifiying compound or a basic compound and combinations thereof, said stabilizing being prior to subjecting said agglomerated admixture to substantial shear which would cause coagulation of said agglomerated admixture; and

G. withdrawing continuously said stabilizing agglomerated admixture from said low-shear zone at said opposite end by a withdrawal means providing flow-mixing in said stabilized agglomerated admixture.

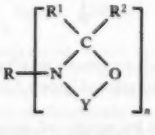
4,043,956

HYDROCURABLE OXAZOLIDINE POLYANHYDRIDE COMPOSITIONS

Thomas W. Hutton, Doylestown; John J. Miller, Warminster; Lawrence K. Wempe, Lansdale, all of Pa., and Sheldon N. Lewis, Zurich, Switzerland, assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Mar. 14, 1975, Ser. No. 558,523
Int. Cl.[2] C07D *261/00*; C09D *3/74*
U.S. Cl. 260—23 R **18 Claims**

1. A hydrocurable composition comprising a polyanhydride having two or more pendant anhydride groups and an oxazolidine of the formula:



wherein R is an organic radical; R^1 is hydrogen, phenyl, benzyl or C_1–C_{12} alkyl; R^2 is hydrogen or C_1–C_4 alkyl or R^1 and R^2 are

joined together with the carbon atom to which they are attached to form a five- or six-membered saturated carbon ring; Y is a radical of the formula

wherein n' is an integer of 2 or 3 and R^3 and R^4 are the same or different radicals selected from hydrogen, C_1–C_{12} alkyl, C_6–C_{10} aryl or C_7–C_{12} aralkyl or alkaryl and n is an integer equal to the valence of R.

12. A polymeric material formed from the composition of claim **1** and water.

4,043,957

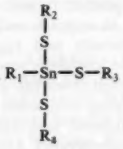
STABILIZED VINYL HALIDE RESIN COMPOSITIONS

Emery Szabo, Freehold, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Apr. 27, 1976, Ser. No. 680,565
Int. Cl.[2] C08K *5/58*
U.S. Cl. 260—23 XA **10 Claims**

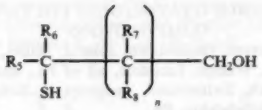
1. A heat and light stable resinous composition comprising a vinyl halide resin and 0.2 to 5 percent by weight, based on the weight of the vinyl halide resin, of a stabilizer system that consists essentially of

a. 15 percent to 75 percent by weight of an organotin mercaptide having the structural formula



wherein R_1, R_2, R_3, and R_4 each represents an alkyl group having 1 to 18 carbon atoms or an alkenyl group having 2 to 18 carbon atoms;

b. 1 to 25 percent by weight of a mercapto alcohol having from 2 to 20 carbon atoms and having the structural formula



wherein R_5, R_6, R_7, and R_8 each represents hydrogen or an aryl, alkyl, alkenyl, or cycloalkyl group and n is 0 or 1;

3 to 15 percent by weight of an organotin sulfide having the structural formula

wherein R_1 and R_2 each represents an alkyl group having 1 to 18 carbon atoms or an alkenyl group having 2 to 18 carbon atoms; and

d. 10 to 80 percent by weight of an inert organic diluent selected from the group consisting of hydrocarbons and alkyl esters of aliphatic monocarboxylic acids.

4,043,958

FLAME RETARDED NBR/PVC COMPOSITIONS

William Paul Whelan, Woodbury, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 515,799, Oct. 17, 1974, abandoned. This application Sept. 10, 1975, Ser. No. 612,146
Int. Cl.[2] C08K *3/22*
U.S. Cl. 260—2.5 FP **7 Claims**

7. A sponged composition comprising an acrylonitrile-butadiene rubber and: (a) from 1 to 200 parts by weight per 100 parts by weight of said rubber of polyvinyl chloride; and (b) from 0.1 to 50 parts by weight per 100 parts by weight of said rubber of an iron oxide selected from the group consisting of the anhydrous and hydrated forms of ferric oxide and ferroso-ferric oxide and mixtures thereof.

4,043,959

POLYOLEFIN CONTAINING EMULSION ADHESIVES

David R. Frye, Pittsburg, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 22, 1975, Ser. No. 580,081
Int. Cl.[2] C08L *23/30*
U.S. Cl. 260—27 R **6 Claims**

1. An adhesive composition comprising an emulsion of (1) 5 to 35 weight percent oxidized polyethylene having a melt viscosity in the range of about 200 cp. to about 1500 cp., an inherent viscosity of about 0.05 to 0.5 and an acid number of about 4 to 30, (2) 10 to 50 weight percent of at least one tackifying resin selected from the group consisting of hydrocarbon resins and polyterpene resins (3) 5 to 25 weight percent emulsifiers and (4) 5 to 80 weight percent water.

4,043,960

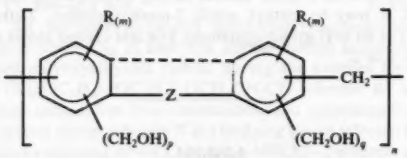
AQUEOUS DISPERSIONS OF THERMOSETTING HYDROXY-FUNCTIONAL FORMALDEHYDE COPOLYMER RESINS DERIVED FROM DIARYL OXIDES, SULFIDES, DIBENZOFURAN OR DIBENZOTHIOPHENE

Paul Joseph Kress, Muncie, Ind., and Raymond A. Plepys, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 19, 1976, Ser. No. 650,086
Int. Cl.[2] C08L *61/28, 29/04;* **C10M** *3/04*
U.S. Cl. 260—29.4 R **12 Claims**

1. An aqueous dispersion comprising:

a. a thermosetting hydroxy-functional condensation copolymer having the repeating unit



wherein R is independently an alkyl group of from 1 to about 10 carbon atoms or a halogen, Z is oxygen or sulfur, the dashed line is an optional chemical bond, the group represented by Z taken with the dashed line represents dibenzofuran and dibenzothiophene moieties, or mixtures thereof, n is 3–10, m is 0–2 and p and q are 0 or 1 with the proviso that the sum of p and q has an average value of 0.1–1 and there is an average of at least 1 hydroxymethyl group per polymer;

b. a curing amount of curing agent selected from the group consisting of strong acids with a pKa of about 2.1 or less and acid-catalyzed hexamethoxymethylmelamine; and

c. at least about a 1 weight percent aqueous polyvinyl alcohol.

4,043,961

VINYL ACETATE-ETHYLENE COPOLYMER EMULSIONS HAVING IMPROVED WATER RESISTANCE

Aleksander Beresniewicz, Wilmington, and Harold Kirkwood Inskip, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 29, 1976, Ser. No. 653,518
Int. Cl.[2] C08L *31/04*
U.S. Cl. 260—29.6 WA 7 Claims

1. An aqueous emulsion consisting essentially of (a) from about 40 to about 60 percent by weight of vinyl acetate-ethylene copolymer having from about 70 to about 90 percent by weight of vinyl acetate and from about 10 to about 30 percent by weight of ethylene, (b) from about 2.5 to about 6.0 percent, based on the weight of the vinyl acetate-ethylene copolymer, of polvinyl alcohol, at least about 20 percent by weight of said polyvinyl alcohol being an at least about 98.0 mole percent hydrolyzed vinyl alcohol copolymer having a methyl methacrylate content of from about 1 to 10 percent by weight, said vinyl alcohol copolymer having a 4% aqueous solution viscosity at 20° C. of from about 5 to about 50 cps.

4,043,962

PARTICULATED RUBBER AND PLASTICS COVERINGS AND BINDERS THEREFOR

Klaus Adler; Engelbert Pichler; Christoph Kemenater; Wilfried Dressler, and Johann Bauer, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Oct. 1, 1975, Ser. No. 618,447
Claims priority, application Germany, Oct. 14, 1974, 2448852
Int. Cl.[2] C08L *61/10, 61/24;* C10M *3/04*
U.S. Cl. 260—29.3 16 Claims

8. A composition forming a resilient coating on drying consisting essentially of from 40% to 75% by weight of a particulated resilient material selected from the group consisting of rubber, plastics and mixtures thereof and from 25% to 60% by weight of a binder consisting essentially of an aqueous mixture of from 1% to 10% by weight of a still water-soluble formaldehyde polycondensate resin selected from the group consisting of a urea-formaldehyde resin, a phenol-formaldehyde resin and a melamine-formaldehyde resin, from 0.5% to 5% by weight of formaldehyde as obtained from a compound selected from the group consisting of formaldehyde and formaldehyde condensates releasing formaldehyde on hydrolysis, and from 85% to 98.5% by weight of a film-forming plastics dispersion.

4,043,963

HEAT-HARDENABLE AQUEOUS EPOXY EMULSIONS CONTAINING AMINOPLAST RESIN

Ronald W. Anderson, Pittsburgh, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 9, 1976, Ser. No. 656,504
Int. Cl.[2] C08L *63/02*
U.S. Cl. 260—29.4 R 11 Claims

1. A thermally curable aqueous emulsion coating composition comprising, as the discontinuous phase of the emulsion, liquid particles of a mixture of resinous polyepoxide and an aminoplast resin having N-methylol groups etherified with 2-hexoxy ethanol to an extent of at least 5%, said resins being dissolved in an essentially water immiscible organic solvent and a surfactant stably suspending said liquid particles in the aqueous continuum of the emulsion, said polyepoxide having a plurality of 1,2-epoxy groups and said aminoplast resin constituting from 5% to 50% by weight of the resin mixture.

4,043,964

CARPET TREATING AND TREATED CARPET

Patsy O. Sherman, Bloomington, and Samuel Smith, Village of Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 415,506, Nov. 14, 1973, Pat. No. 3,916,053, which is a continuation of Ser. No. 180,216, Sept. 12, 1971, abandoned, which is a continuation-in-part of Ser. No. 76,982, Sept. 30, 1970, abandoned. This application July 30, 1975, Ser. No. 600,401
Int. Cl.[2] C08L *27/12*
U.S. Cl. 260—29.6 F 2 Claims

1. A composition suitable for the treatment of carpets to impart durable soil-resistant and stain repelling properties thereto, said composition comprising at least 0.1% solids in a liquid medium said solids comprising:

a. a water-insoluble addition polymer derived from polymerizable ethylenically unsaturated monomer free of nonvinylic fluorine, said polymer having at least one major transition temperature higher than about 45° C. and a solubility parameter of at least about 8.5, and

b. a water-insoluble fluorinated component containing fluoroaliphatic radical of at least 3 carbon atoms, said fluorinated component containing at least 25 percent by weight of fluorine in the form of fluoroaliphatic radicals and having at last one major transition temperature higher then about 45° C.;

said composition being substantially free of polymers not having a major transition temperature higher than about 45° C.

4,043,965

COPOLYMER OF ACRYLIC ACID AND 1,1-DIHYDROPERFLUOROOCTYL METHACRYLATE USEFUL FOR APPLYING NON-PERMANENT SOIL RELEASE FINISH

Robert E. Dickson, Belle Mead, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 414,880, Nov. 12, 1973, Pat. No. 3,912,681, which is a continuation-in-part of Ser. No. 249,089, May 1, 1972, Pat. No. 3,836,496. This application July 25, 1975, Ser. No. 599,195
The portion of the term of this patent subsequent to Sept. 17, 1991, has been disclaimed.
Int. Cl.[2] C08F *218/10;* C08L *31/02*
U.S. Cl. 260—29.6 F 3 Claims

1. A stable aqueous emulsion containing a copolymer consisting essentially of acrylic acid and 1,1-dihydroperfluorooctyl methacrylate in a weight ratio of about 21:1 to 5:4.

4,043,966

FLUOROCARBON POLYMER COMPOSITIONS WITH ALUMINUM PHOSPHATE-INORGANIC ACID MIXTURE BINDER

John Wilmar Edwards, Welwyn Garden City, and Barry William Farrant, St. Neots, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 594,000, July 8, 1975, abandoned, which is a continuation of Ser. No. 368,049, June 7, 1973, abandoned, which is a continuation-in-part of Ser. No. 207,650, Dec. 13, 1971, abandoned. This application Aug. 11, 1976, Ser. No. 713,508
Claims priority, application United Kingdom, July 27, 1971, 35203/71; Nov. 15, 1971, 52940/71; June 8, 1972, 26801/72
Int. Cl.[2] C08L *27/18*
U.S. Cl. 260—29.6 F 13 Claims

1. A coating composition which consists essentially of an aqueous dispersion containing 1% to 60% by weight of fluorocarbon polymer resin and as binder a solution of an aluminium phosphate-acid mixture, identifiable as equivalent to a mixture of aluminium phosphate in an acid selected from the group consisting of hydrochloric, sulphuric, nitric and hydrobromic acids, the amount of binder in the composition being that the

weight of aluminum divided by the weight of fluorocarbon polymer resin is from 0.02 to 0.25, and in the binder, the ratio of the number of aluminum atoms to the number of molecules of the said acid is from 1:0.1 to 1:5 and the ratio of the number of aluminum atoms to the number of atoms of phosphorus is from 1:0.1 to 1:1.8.

4,043,967

LATENTIZING SOLVENTS FOR EPOXY SYSTEMS

Eric P. Berg, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 20, 1976, Ser. No. 659,792
Int. Cl.[2] C08K *5/01, 5/06, 5/11, 5/15*
U.S. Cl. 260—30.4 EP **15 Claims**

1. A latent polymerizable epoxy material comprising a polymerizable epoxy monomer or precondensate, a catalytically active amount of a bis(highly fluorinated aliphatic sulfonyl)methane, and a volatile, liquid solvent selected from ethers, esters, and aromatic compounds which are not reactive with said epoxy material, said solvents comprised of only C, H and O atoms and having a vapor pressure at 25° C between 0.10 and 650 torr, said solvent being present in an amount at least equal to 10% of the weight of said polymerizable epoxy material.

4,043,968

PROCESS FOR PRODUCING METHYLOLATED AMIDE COPOLYMERS IN CONCENTRATED ORGANIC SOLVENT SOLUTION

Arthur T. Spencer, New Providence, and Stanley F. Siranovich, Highland Park, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 30, 1976, Ser. No. 653,687
Int. Cl.[2] C08F *8/00, 22/38;* **C08K** *5/05*
U.S. Cl. 260—33.4 R **10 Claims**

1. A process for the production of methylolated amide copolymers in concentrated alcoholic organic solvent solution comprising, copolymerizing polymerizable monomers consisting essentially of monoethylenically unsaturated monomers, at least 50% of which are monoethylenically unsaturated monomers selected from vinyl aromatic hydrocarbons, acrylic-type esters, vinyl esters and monoethylenic nitriles, and including from 4–25% of an amide monomer selected from acrylamide or methacrylamide, in alcoholic organic solvent solution to provide an amide copolymer solution, removing volatile nitrogen-containing decomposition products of the amide monomer in an amount corresponding to at least 0.5% by weight of the amide monomer used without removing more than 15% of solvent, based on the weight of the solution, and then reacting the amide copolymer in said solution with formaldehyde in the presence of an acid catalyst.

4,043,969

CASTING COMPOUND FOR SEMICONDUCTOR DEVICES

Christian R. Sporck, Saratoga, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 353,458, April 23, 1973, Pat. No. 3,838,094, and Ser. No. 475,441, May 31, 1974, abandoned.
This application Apr. 14, 1975, Ser. No. 567,724
Int. Cl.[2] C08L *63/00*
U.S. Cl. 260—37 EP **7 Claims**

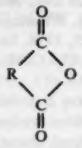
1. A curable composition which is liquid at room temperature or at a slightly elevated temperature and which comprises

a. a major proportion of a polyepoxide

$$A-(X)_a-B$$

wherein A and B are selected from the class of (1) cycloaliphatic groups, (2) open chain aliphatic groups and (3) segments of a cycloaliphatic single ring or fused ring systems, A and B each containing an epoxide group, X is a linking entity selected from the class of a valence bond and an atom or group of atoms and a is unity except where A and B belong to group (3) in which case a is zero;

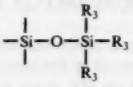
b. a cross-linking agent in the form of an anhydride of a polycarboxylic acid



wherein R is a cycloaliphatic group, an open chain aliphatic group or an aromatic group

c. a catalyst capable of promoting polymerizing and cross-linking of (a) and (b); and

d. a filler in the form of a finely divided fused silica the surface of which has been treated with a substance to convert silanol groups to groups



wherein the R_3's are the same or different hydrocarbon groups

said components (a) and (b) being present in amounts and proportions to enable the composition to cure at temperatures not greater than about 175° C, to a hard product;

said components (a), (b) and (d) being selected and their proportions being such that the composition is a pourable liquid at temperatures not greater than about 40° C and is free of significant quantities of chloride and sodium ions.

4,043,970

RESOLE RESIN BINDER COMPOSITION

Ronald H. Dahms, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 24, 1975, Ser. No. 634,395
Int. Cl.[2] C08L *61/10;* **C08G** *8/10*
U.S. Cl. 260—29.3 **12 Claims**

1. A binder composition comprising a low viscosity resole resin and a metal salt curing accelerator, said salt being soluble in said resole resin, having a metal ion selected from the group consisting of barium (Ba^{++}), magnesium (Mg^{++}), manganese (Mn^{++}), chromium (Cr^{+++}), zinc (Zn^{++}), aluminum (Al^{+++}), dibasic aluminum $Al(OH_2^+)$, cobalt (Co^{++}) and mixtures thereof and having an organic acid salt radical selected from the group consisting of formate, acetate, propionate, benzoate, lactate and mixtures thereof said metal salt being present in from about 0.5 to 5 parts based on 100 parts of resole resin solids.

4,043,971

THERMOPLASTIC POLYBUTYLENE TEREPHTHALATE MOLDING COMPOSITIONS OF IMPROVED TRACKING RESISTANCE

Rolf Wurmb, Heidelberg; Joachim Kunde, Frankenthal; Johannes Schlag, Ludwigshafen, and Hans Georg Dorst, Deidesheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Apr. 21, 1976, Ser. No. 678,946
Claims priority, application Germany, May 30, 1975, 2524121
Int. Cl.[2] C08K *3/30*
U.S. Cl. 260—40 R **4 Claims**

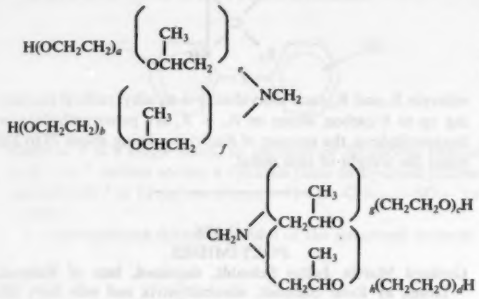
1. Molding compositions of polybutylene terephthalate having improved tracking resistance and containing as fillers, $CaSO_4$, $BaSO_4$ or mixtures thereof in amounts of from 5 to 60% by weight of the total weight of the composition.

4,043,972
STABILIZING POLYAMIDE ANTISTATIC COMPOSITIONS

Ronald D. Mathis, Taylors, S.C., assignor to Phillips Fibers Corporation, Greenville, S.C.

Filed Oct. 6, 1975, Ser. No. 620,085
Int. Cl.[2] C08J *3/20;* **C08L** *3/00;* **C08K** *5/50*
U.S. Cl. 260—45.9 NC **12 Claims**

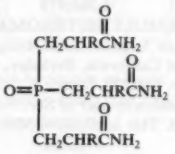
1. A composition of matter comprising a polyamide; an antistatic property imparting amount of an antistatic agent comprising the reaction product of (1) a tetrol compound of the formula



where *a, b, c, d, e, f, g,* and *h* are each a whole number and the total of *a, b, c,* and *d* is between 8 and 1,000 and the total of *e, f, g,* and *h* is between 8 and 850, wherein the molecular weight of said tetrol compound is between about 1,650 to about 135,000 and said ethylene oxide moieties make up from about 10 to about 90 weight percent of said tetrol compound, and (2) a dicarboxylic acid ester having the formula

$$R'OOC—A—COOR'$$

wherein A is a valence bond of a divalent hydrocarbyl radical having from 1 to 8 carbon atoms and R′ is an alkyl group containing 1 to 4 carbon atoms or a hydroxyalkyl group containing 2 to 4 carbon atoms, wherein the two R′ radicals may be the same or different; and a thermally stabilizing amount of a phosphine oxide of the formula



wherein each R is individually selected from the group consisting of hydrogen or an alkyl group containing 1 to 4 carbon atoms.

4,043,973
MULTICHROMOPHORIC ULTRAVIOLET STABILIZERS FOR ORGANIC COMPOSITIONS

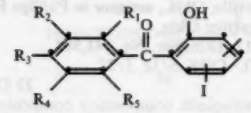
Richard H. S. Wang, and Gether Irick, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 511,570, Oct. 2, 1974, Pat. No. 3,936,419. This application Oct. 28, 1975, Ser. No. 626,521
Int. Cl.[2] C08K *5/47, 5/35, 5/34*
U.S. Cl. 260—45.8 NT **10 Claims**

1. An organic composition susceptible to ultraviolet degradation stabilized against such degradation with a stabilizing amounts of a composition of matter comprising compounds having the formula:

$$(A—B)_n—C$$

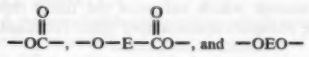
wherein A is a group having the structure:



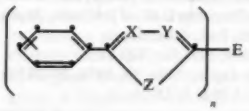
wherein

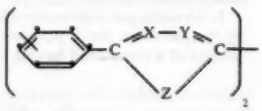
R_1, R_2, R_3, R_4, R_5 and I are hydrogen, fluoro, chloro, bromo, lower alkyl, substituted lower alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, lower alkylaryl, alkoxy, aryloxy, substituted amino, cyano, carboalkoxy, and the substituents R_1 and R_2, R_2 and R_3,R_3 and R_4, and R_4 and R_5, combined with the carbon atoms to which they are attached, are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3, R_4, R_5 and I;

B is a linking group connecting A and C and can have the structure



where E is lower alkylene or substituted lower alkylene; the C group is a heterocyclic group having the structures





wherein

X and Y are a carbon atom, a carbon atom containing an alkyl group containing 1 to 12 carbon atoms, a carbon atom containing an aryl group containing 6 to 18 carbon atoms or a nitrogen atom; Z is an oxygen atom, a sulfur atom, or a nitrogen atom containing a hydrogen atom or a substituted or unsubstituted lower alkyl group having 1 to 12 carbon atoms; E is a substituted or unsubstituted, branched, or unbranched alkylene containing 1 to 12 carbon atoms or arylene containing 6 to 18 carbon atoms; n is an integer from 1 to 6.

4,043,974
PROCESS FOR STABILIZING POLYAMIDES

John Maxwell Davis, Signal Mountain, Tenn., and Sigred Boyd Lanoux, Lafayette, La., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 546,593, May 2, 1966, abandoned. This application Nov. 10, 1975, Ser. No. 630,425
Int. Cl.[2] C08K *5/53*
U.S. Cl. 260—45.75 C **8 Claims**

1. In a process for the preparation of a heat-stabilized polycarbonamide filament having enhanced acid-dyeability including preparing the polymer by melt polymerization in the presence of a soluble copper compound, a metal halide and a phosphorus compound and melt-spinning a filament from the polymer, the improvement for reducing the loss of soluble copper from the molten polymer comprising adding as the phosphorus compound at least 0.01% based on the weight of the polymer of hexamethylene diammonium phenyl-phosphonate to the polymer precursors before or during polymerization.

4,043,975

FLAME-RESISTANT POLYOLEFIN COMPOSITIONS

Howard W. Bost, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 12, 1976, Ser. No. 741,584
Int. Cl.[2] C08K 5/52, 3/22
U.S. Cl. 260—45.75 W 22 Claims

1. A flame-resistant polyolefin composition comprising (1) normally solid polyolefin; (2) a phosphorus-containing flame retardant comprising the reaction product of (a) at least one phosphorus oxide compound of the formula $(P_2O_5)_{0.5-1.0}(H_2O)_{0.0-1.5}$, (b) melamine, and (c) at least one saturated open-chain polyol containing from 5 to 15 carbon atoms and from 4 to 8 hydroxyl groups per molecule, which reaction product has been heated prior to incorporation into said polyolefin composition under such conditions that said reaction product will not cause the significant foaming of the polyolefin composition when said polyolefin composition is subjected to molding conditions; and (3) at least one zinc compound selected from the group consisting of zinc oxide and zinc bromide; wherein said phosphorus-containing flame retardant is present in an amount that alone would be insufficient to impart to said polyolefin a flame resistance rating of V-O according to the Modified UL-94 test and wherein said at least one zinc compound is present in an amount which enhances the flame resistance provided by the phosphorus-containing flame retardant.

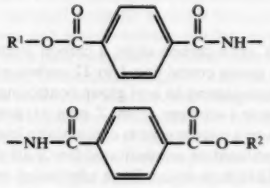
4,043,976

STABILIZED OLEFIN POLYMER COMPOSITION

Toshio Yoshikawa; Nagayoshi Sakamoto; Masayuki Kurita; Shunji Oh-e, and Lomitado Nagamori, all of Ichihara, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Sept. 14, 1976, Ser. No. 723,141
Claims priority, application Japan, Mar. 30, 1976, 51-34208
Int. Cl.[2] C08K 5/25
U.S. Cl. 260—45.8 N 9 Claims

1. An olefin polymer composition which comprises 100 parts by weight of an olefin polymer and from 0.001 to 5 parts by weight of a compound having the formula



in which R^1 and R^2 are the same or different, and each represents an alkyl group having 1 - 4 carbon atoms.

4,043,977

NON-STICK POLYORGANOSILOXANE COATING COMPOSITIONS

Armand deMontigny; Kurt-Wilhelm Eichenhofer; Hans Toepsch, all of Leverkusen, and Reinhard Schliebs, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 25, 1976, Ser. No. 670,583
Claims priority, application Germany, Apr. 9, 1975, 2515484
Int. Cl.[2] C08G 77/04
U.S. Cl. 260—46.5 UA 7 Claims

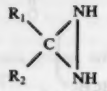
1. A composition for coating paper, films and fiber materials, comprising

a. 4 parts by weight of a linear polyorgano siloxane with ends stopped by vinyl groups and having a viscosity of up to about 500 cP (20° C) and

b. about 0.5 to 1.5 parts by weight of a crosslinking agent containing Si-vinyl units and SiH units and comprising molecules with a miximum of about 10 Si atoms bonded to one another via oxygen, and wherein the two reactive groups are present in adjacent positions in one and the same molecule and the remaining valencies of the Si atom are saturated by methyl groups and the SiH groups are present in a ratio of about 1:1 to 2.5:1 to the total amount of all Si-vinyl units present in the composition,

c. a platinum metal complex, the amount of metal being up to about 0.01 part by weight - based on 100 parts by weight of total composition, and

d. a diaziridine of the formula



wherein R_1 and R_2 each individually is an alkyl radical containing up to 6 carbon atoms or $R_1 + R_2$ are pentamethylene or hexamethylene, the amount of diaziridine being about 75 to 250 times the weight of said metal.

4,043,978

POLYIMIDES

Gerhard Martin Julius Schmidt, deceased, late of Rehovot, Israel, by Ester Schmidt, administratrix and sole heir; Michael Dror; Gad Friedman, both of Rehovot, Israel, and Harold H. Levine, La Jolla, Calif., assignors to Yeda Research & Development Co., Ltd., Rehovot, Israel

Filed Mar. 20, 1974, Ser. No. 453,049
Claims priority, application Israel, Mar. 25, 1973, 41869
Int. Cl.[2] C08G 73/10, 73/12
U.S. Cl. 260—47 CP 10 Claims

1. A process for the production of polyimide polymers, which comprises reacting cyclooctadiene-1,2,5,6-tetracarboxylic acid bisanhydride with 4,4'-diamino-diphenylmethane, 4,4'-diamino-diphenyl ether, a mixture of 4,4'-diamino-diphenyl-methane and 4,4'-diaminodiphenyl ether or hexamethylene diamine in the presence of m-cresol as a solvent.

4,043,979

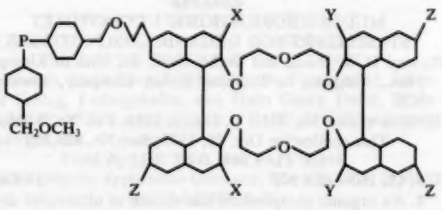
POLYMER-MULTIHETEROMACROCYCLES

Donald J. Cram, Los Angeles, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 448,333, March 5, 1974, Pat. No. 4,001,279, which is a continuation-in-part of Ser. No. 346,089, March 29, 1973, abandoned. This application Mar. 31, 1976, Ser. No. 672,211
Int. Cl.[2] C08F 12/08
U.S. Cl. 260—47 UP 6 Claims

1. A compound of the formula

(III)



wherein P is the backbone of a solid styrene-divinylbenzene copolymer, each Z is H or CH_2CH_2OH, each X is either H or CH_3, each Y is either H or CH_3, and the binaphthyl groups of the macrocycle are in the (RR)- or (SS)- configurations.

4,043,980

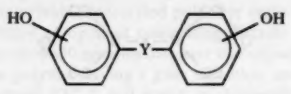
FLAME RETARDANT POLYCARBONATE HAVING IMPROVED CRITICAL THICKNESS

Arthur L. Baron, and Parameswar Sivaramakrishnan, both of New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed May 18, 1976, Ser. No. 687,491
Int. Cl.[2] C08G 63/62
U.S. Cl. 260—47 XA 14 Claims

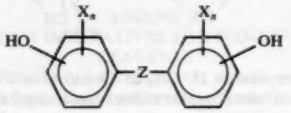
1. In a flame retardant polycarbonate having a weight average molecular weight of 10,000 to 200,000 based on the reaction product of:

a. an aromatic diol of the structural formula



wherein Y is a single bond, an alkylene or alkylidene radical with 1 to 7 carbon atoms, a cycloalkylene or cycloalkylidene radical with 5 to 12 carbon atoms, —O—, —CO—, —SO—, or $—SO_2—$;

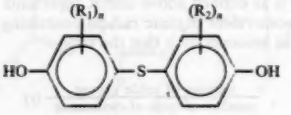
b. a halogenated dihydric phenol of the structural formula



wherein Z is a single bond, an alkylene or alkylidene radical with 1 to 7 carbon atoms, —O—, —CO—, —SO— or $—SO^2—$ and X is chlorine or bromine and n is 1 to 4; and,

c. a carbonic acid derivative, the improvement comprising co-reacting with components (a), (b) and (c);

d. an effective amount of a thiodiphenol of the structural formula



wherein R_1 and R_2 are hydrogen or lower alkyl groups having 1 to 4 carbon atoms and n equals 0 to 2 to improve the critical thickness of said polycarbonate.

4,043,981

COPOLYESTERS DERIVED FROM ETHOXYLATED 3,5-DIBROMO-4-HYDROXYBENZOIC ACID

William L. O'Brien, Cincinnati, Ohio, assignor to Emery Industries, Inc., Cincinnati, Ohio

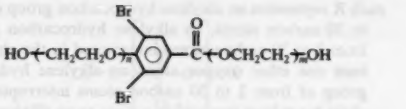
Filed Feb. 6, 1976, Ser. No. 655,780
Int. Cl.[2] C08G 63/68
U.S. Cl. 260—47 C 7 Claims

1. A flame retardant copolyester having improved thermal and ultraviolet stability comprising the condensation product of

a. an aliphatic or alicyclic diol having from 2 to 10 carbon atoms,

b. an aliphatic, alicyclic or aromatic dicarboxylic acid having from 4 to 12 carbon atoms or lower allkyl esters thereof, and

c. ethoxylated brominated hydroxybenzoic acid of the formula



where n amd m are integers from 1 to 3, said ethoxylated brominated hydroxybenzoic acid comprising about 1 to 30% by weight of the copolyester composition.

4,043,982

PEROXIDE INITIATED POLYMERIZABLE ACRYLATE-ISOCYANATE MONOMER COMPOSITIONS

Denis J. O'Sullivan; Bernard J. Bolger, and T. Eisert Casey, all of Dublin, Ireland, assignors to Loctite (Ireland) Limited, Dublin, Ireland

Continuation of Ser. No. 362,970, May 23, 1973, abandoned.
This application July 30, 1975, Ser. No. 600,384
Claims priority, application Ireland, May 29, 1972, 717/72
Int. Cl.[2] C08F 120/36
U.S. Cl. 260—47 UA 9 Claims

1. A polymerizable composition which comprises a first part consisting essentially of a diacyl peroxide of the formula $Ar.CO.O_2CO.Ar$ wherein each Ar is an aryl or substituted aryl radical containing up to about 10 carbon atoms, or a silyl peroxide of the formula $CH_2{=}CHSi(OOR^1)_3$ wherein each R^1 is a C_1 to C_6 alkyl radical; and a second part consisting essentially of a free radical polymerizable monomer which is made by reacting at a temperature of 0°–200° C an organic polyisocyanate with a polymerizable acrylate ester having a reactive hydrogen atom in a hydroxy or a primary or secondary amino group in the alcoholic moiety of said ester, each such hydrogen atom having reacted with an isocyanate group, said polyisocyanate having the formula

$$(O{=}C{=}N)_nR^4$$

wherein n is 2 and R^4 is a $C_{2\text{-}20}$ alkylene, alkenylene or cycloalkylene radical or a $C_{6\text{-}40}$ arylene, alkarylene, aralkylene, alkyloxyalkylene or aryloxyarylene radical which may be substituted by 1-4 chlorine atoms or by 1-3 amino or mono- or di-$C_{1\text{-}3}$-alkylamino or $C_{1\text{-}3}$ alkoxy groups, and about 0.1 to about 10 percent by weight of the second part of an aryl amine polymerization accelerator of the formula $ArNR^8R^9$ wherein Ar is as defined above and each R^8 and R^9 is a hydrogen or a C_1 to C_4 alkyl group.

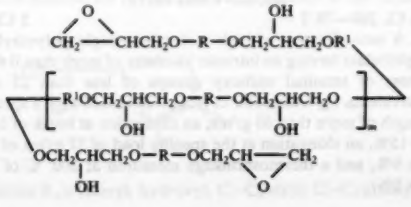
4,043,983

ELECTRICALLY-CONDUCTIVE RESINS, AND INTERMEDIATES FOR THEIR PREPARATION

Bernard Peter Stark, Stapleford, and Michael Robert Thoseby, Cambridge, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 12, 1976, Ser. No. 715,571
Claims priority, application United Kingdom, Jan. 22, 1975, 2699/75
Int. Cl.[2] C08G 59/24; C07D 407/00
U.S. Cl. 260—65 8 Claims

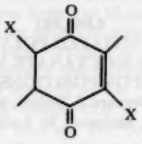
1. Epoxide resins of the general formula



where

each R represents an alkylene hydrocarbon group of from 2 to 30 carbon atoms, an alkylene hydrocarbon group of from 2 to 30 carbon atoms interrupted in the chain by at least one ether oxygen atom, an alkylene hydrocarbon group of from 2 to 30 carbon atoms interrupted in the chain by at least one sulfide group, or an alkylene hydrocarbon group of from 2 to 30 carbon atoms interrupted in the chain by at least one carbonyloxy group,

each R^1 represents a group of formula



X being a halogen atom, and

m is zero or a positive integer of at most 50.

4,043,984

AMINOPLASTS ELASTICIZED WITH BENZOIC ACID ESTERS

Karl-Heinz Keil, Offenbach (Main); Karlfried Keller, Bergen-Enkheim; Joachim Ribka, Offenbach (Main)-Buergel, and Dieter Tichy, Frankfurt (Main) all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

Filed Sept. 4, 1975, Ser. No. 610,317

Claims priority, application Germany, Sept. 12, 1974, 2443645

Int. Cl.[2] C08G *12/26, 2/28, 2/30, 14/02*

U.S. Cl. 260—67.6 R **7 Claims**

1. In the combination of an aminoplast resin with an elasticizing agent to improve the elasticity of the cured resin, the improvement according to which the elasticizing agent has the formula

$$R—C_6H_4—COO—X—OH$$

wherein C_6H_4 denotes a phenylene group, R denotes a hydrogen atom or a methyl or ethyl group, and X denotes an unbranched or branched alkylene group with 2 to 6 carbon atoms whose carbon chain is either uninterrupted or interrupted by one oxygen atom.

4,043,985

TIRE MONOFILAMENTS

Günther Vock, Strassberg, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 484,162, June 28, 1974, Pat. No. 3,998,920, which is a continuation of Ser. No. 313,533, Dec. 8, 1972, abandoned. This application Sept. 17, 1976, Ser. No. 725,133

Claims priority, application Germany, Dec. 14, 1971, 2161967

Int. Cl.[2] C08G *63/12*

U.S. Cl. 260—75 T **1 Claim**

1. A monofilament of high molecular weight polyethylene terephthalate having an intrinsic viscosity of more than 0.67, a content of terminal carboxy groups of less than 25 milliequivalents/kg, a diameter of from 0.20 to 0.55 mm, a specific strength of more than 60 g/tex, an elongation at break of from 6 to 15%, an elongation at the specific load of 27 g/tex of less than 6%, and a thermoshrinkage measured at 160° C of less than 8%.

4,043,986

POLYMERS POSSESSING IMIDE GROUPS

Max Gruffaz, La Mulatiere, and Gerard Lefebvre, Lyon, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Apr. 16, 1975, Ser. No. 568,447

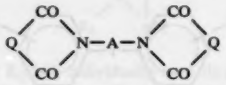
Claims priority, application France, Apr. 18, 1974, 74.13529

Int. Cl.[2] C08G *69/26*

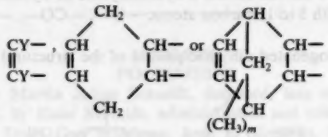
U.S. Cl. 260—78 UA **10 Claims**

1. A process for preparing a polymer possessing imide groups, which consists essentially of reacting, at 50° to 300° C., cyanamide and a product possessing imide groups selected from the group consisting of:

a. a bis-imide of the general formula:

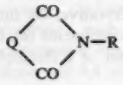


in which Q represents a divalent radical of the formula:



wherein Y represents H, CH_3 or Cl and *m* is 0 or 1, and A represents a divalent organic radical containing 2 to 30 carbons atoms; and

b. a mixture of said bis-imide and a mono-imide of the general formula:



in which Q is as defined above and R represents a hydrogen, atom or a monovalent organic radical containing 1 to 20 carbon atoms, in amounts such that the ratio

$$\frac{\text{number of imide groups}}{\text{number of mols of cyanamide}} \quad (r)$$

is from 1 to 20.

4,043,987

SUBSTITUTED AMMONIUM POLYPHOSPHATE COMPOSITION

Carmel Réjean Jolicoeur, Sherbrooke, and Richard Riverin, Chomedey, both of Canada, assignors to Encoat Chemicals Limited, Montreal, Canada

Filed Apr. 11, 1975, Ser. No. 567,260

Claims priority, application Canada, Dec. 10, 1974, 215811

Int. Cl.[2] C07D *251/66;* **C07F** *9/02*

U.S. Cl. 260—78.41 **21 Claims**

1. A substantially water-insoluble substituted ammonium polyphosphate composition having the general formula (I)

$$Z_1—O[—(PO_3NH_4)_j—(PO_3R'N)_k—]_lZ_2 \quad (I)$$

wherein Z_1 and Z_2 are each selected from $—NH_4$ and —NR', N is a reactive nitrogen, R' is the residue R, of an organic nitrogenous spumific agent of general formula (II)

$$R(NH_2)_p(NH)_q(N)_r \quad (II)$$

wherein *p*, *q* and *r* are integers from 0 to 6 and $(p + q + r)$ is 1 or more; said spumific agent hving a nitrogen to carbon ratio of 5 : 1 to 0.1 : 1, and a thermal decomposition temperature

above 150° C, and wherein *j* is from 1 to 20, *k* is 1 to 10 and *y* is 1 or more.

4,043,988

LOW PROFILE POLYESTER MOLDING COMPOSITION

Victor F. G. Cooke, Youngstown, and Donald H. Thorpe, Williamsville, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Jan. 2, 1976, Ser. No. 646,112
Int. Cl.[2] C08L *67/06*
U.S. Cl. 260—862 15 Claims

1. A molding composition comprising

A. a polymerizable unsaturated polyester component; and

B. an additive component comprising discrete particles of less than about 50 microns diameter of a cross-linked vinyl chloride polymer having a glass transition temperature of below about 100° C and which is chemically inert with respect to the polyester component and is swellable but insoluble therein, said additive component comprising the polymeric reaction product of vinyl chloride and at least one polyfunctional monomer.

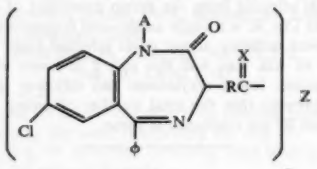
4,043,989

OXAZEPAM DERIVATIVES FOR IMMUNOASSAY REAGENTS

Richard S. Schneider, Saratoga, Calif., and Steven J. Gould, South Windham, Conn., assignors to Syva Company, Palo Alto, Calif.

Filed Sept. 11, 1975, Ser. No. 612,425
Int. Cl.[2] C07G *7/00*
U.S. Cl. 260—112 R 6 Claims

1. A compound of the formula:



wherein:

A is hydrogen or lower alkyl of from 1 to 3 carbon atoms;

R is a linking group of from 0 to 8 carbon atoms and 0 to 4 heteroatoms which are chalcogen and nitrogen;

Z is Y, wherein Y is an antigenic poly(amino acid);

n is at least 1 and not greater than the molecular weight of Y divided by 500; and

X is chalcogen or nitrogen.

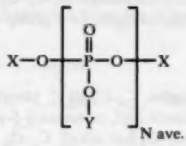
4,043,990

PROCESS FOR THE RECOVERY OF WHEY PROTEIN HAVING IMPROVED SOLUTION CLARITY USING POLYPHOSPHATES

Nicholas Melachouris, Hartsdale, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 452,894, March 20, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 650,203
Int. Cl.[2] A23C *21/00*; A23J *1/20*
U.S. Cl. 260—112 R 26 Claims

1. In a process for the recovery of protein having improved solution clarity at acid pH from a proteinaceous aqueous solution containing whey protein in which a medium chain length polyphosphate of the formula:



wherein X is selected from the group consisting of proteinaceous and alkali metal; and Y is alkali metal; and N ave. represents an average chain length from about 3 to about 20,000, is admixed with a proteinaceous aqueous solution containing whey protein to form a protein-phosphate complexed solution; and the pH of said protein-phosphate complexed solution is adjusted to a range of from about 4.5 to about 2.0 to form a protein-phosphate precipitate, the protein-phosphate precipitate is separated from said mineral solution and dispersed in an aqueous solution having a final pH from about 5.0 to about 12.0 and the protein-phosphate dispersion is contacted with an anionic ion exchange resin to remove phosphate from said dispersion and provide a protein-aqueous effluent; the improvement which consists essentially of pretreating said proteinaceous aqueous solution containing whey protein prior to subjecting said proteinaceous aqueous solution containing whey protein to the process outlined in the preamble which pretreatment consists essentially of the steps of:

a. admixing with said proteinaceous aqueous solution containing whey protein a phosphate selected from the group consisting of tetrasodium pyrophosphate, tetrapotassium pyrophosphate, sodium acid pyrophosphate, potassium acid pyrophosphate, potassium tripolyphosphate, sodium tripolyphosphate, calcium pyrophosphate, magnesium pyrophosphate, ammonium pyrophosphate, or mixtures thereof at a concentration greater than 1.0 gram per liter to thereby form a phosphate complexed solution;

b. adjusting the pH of said phosphate complexed solution to a neutral range of from about 6.0 to about 8.0 by the addition of a base to a level of base sufficient to form a precipitate and a pretreated proteinaceous aqueous solution containing whey protein;

c. separating said precipitate from said pretreated proteinaceous aqueous solution containing whey protein to give a separated precipitate and a separated pretreated proteinaceous aqueous solution containing whey protein; and

d. recovering the protein from said pretreated proteinaceous aqueous solution containing whey protein using said process, said protein having improved solution clarity at acid pH.

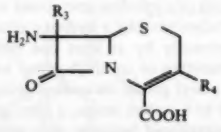
4,043,991

PREPARATION OF PEPTIDES AND CEPHALOSPORINS

Noritaka Hamma, Sakai; Masataka Fukumura, Kobe; Kaoru Maeshima, Takarazuka, and Takenari Nakagome, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sept. 22, 1975, Ser. No. 615,751
Claims priority, application Japan, Sept. 20, 1974, 49-108985; May 21, 1975, 50-61233
Int. Cl.[2] C07C *103/52*
U.S. Cl. 260—112.5 R 18 Claims

1. A process for preparing a cephalosporin of the formula:



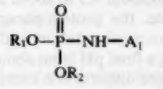
(I-a)

wherein R_4 is formyl, hydroxyl, C_1–C_4 alkyl, C_1–C_4 alkoxy or a

methyl group substituted with hydroxy, C_1–C_4 alkoxy, C_2–C_5 alkanoyloxy, phenoxy, carbamyloxy, C_1–C_4 alkylamino, C_2–C_5 alkanoylamino, azido, halogen, or a group of the formula:

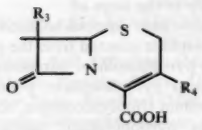
$$-S-R_5$$

wherein R_5 is hydrogen, C_1–C_4 alkyl, phenyl, C_2–C_5 alkanoyl, pyridyl, 1,3,4-thiadiazol-2-yl, or tetrazol-5-yl; and R_3 is hydrogen, C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxy, phenyl(C_1–C_4)alkyl, hydroxy, phenoxy, C_2–C_5 alkanoyloxy, C_1–C_4 alkylsulfonyloxy, mercapto, C_1–C_4 alkylthio, phenylthio, amino, C_1–C_4 alkylamino, C_2–C_5 alkoxycarbonyl, phenyl(C_2–C_5)alkanoyl, carboxyl, formyl, azido, or halogen, or the salt or the ester thereof, which comprises reacting a phosphoramide derivative of the formula:



(II-a)

wherein R_1 and R_2 are each C_1–C_6 alkyl, C_3–C_7 cycloalkyl, phenyl, p-tolyl, p-chlorophenyl, benzyl, p-nitrobenzyl, or p-chlorobenzyl; and A_1 is a cephalosporin residue of the formula:



(I-a')

wherein R_3 and R_4 are as defined above, with a phosphorus acid, or the ester or the anhydride thereof.

4,043,992

METHOD FOR PREPARING ACYLATED PRODUCTS

Yasuo Fujimoto, and Nobuhiro Nakamizo, both of Machida, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Division of Ser. No. 498,125, Aug. 16, 1974, Pat. No. 3,963,728, which is a division of Ser. No. 49,918, June 25, 1970, Pat. No. 3,867,424. This application Apr. 2, 1976, Ser. No. 673,149

Claims priority, application Japan, June 30, 1969, 44-51061

The portion of the term of this patent subsequent to Feb. 18, 1992, has been disclaimed.

Int. Cl.² C07C *102/06*

U.S. Cl. 260—112.5 R **12 Claims**

1. In a process for preparing a carboxylic acid amide which comprises acylating an amino acid or ester thereof with an ester derived from an aliphatic or aromatic carboxylic acid, the improvement which comprises carrying out said acylation in the presence of an alkali-metal salt, an alkaline earth metal salt or a quaternary ammonium salt of a pyridine compound whose pyridine nucleus is directly substituted by a hydroxy group or a mercapto group, and optionally by at least one member selected from the group consisting of an alkyl group having from 1 to 6 carbon atoms, an aryl group, an aralkyl group, an alkoxy group having from 1 to 6 carbon atoms, a nitro group, a cyano group and an unsubstituted benzene ring which is fused to the pyridine nucleus.

4,043,993

PENTAPEPTIDES AND METHODS FOR THEIR PRODUCTION

Francis John Tinney; Ernest D. Nicolaides, and Alfred Campbell, all of Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed June 23, 1976, Ser. No. 699,124

Int. Cl.² C07C *103/52*

U.S. Cl. 260—112.5 LH **8 Claims**

1. A pentapeptide of the formula

$$X-R-Tyr(benzyl)-Ser(benzyl)-R^1-Y$$

wherein X is t-butoxycarbonyl or benzyloxycarbonyl, R is a single amino acid fragment, a dipeptide fragment or tripeptide fragment utilizing amino acids selected from the group consisting of Pro. Aze, His(benzyl) and Trp; R^1 is a single bond or a single amino acid fragment or a dipeptide fragment utilizing amino acids selected from the group consisting of Ala, Trp and His and Y is lower alkoxy, hydrazino, amino, lower alkylamino or di(lower alkyl)amino with the proviso that the total number of amino acid units when R and R^1 are combined is three.

4,043,994

PENTAPEPTIDES AND METHODS FOR THEIR PRODUCTION

Eugene Leroy Wittle; Ernest D. Nicolaides, both of Ann Arbor, and Marland Paul Hutt, Saline, all of Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed June 23, 1976, Ser. No. 699,125

Int. Cl.² C07C *103/52*

U.S. Cl. 260—112.5 LH **7 Claims**

1. A pentapeptide of the formula

$$X-R-Ser(benzyl)-Tyr(benzyl)-R^1Y$$

wherein X is t-butoxycarbonyl or benzyloxycarbonyl, R is a single amino acid fragment or a dipeptide fragment utilizing amino acids selected from the group consisting of Aze, His(benzyl) and Trp; R^1 is a single amino acid fragment or a dipeptide fragment utilizing amino acids selected from the group consisting of Ala, Leu and Pro and Y is lower alkoxy, hydrazino, amino, lower alkylamino and di(lower alkyl)amino with the proviso that the total number of amino acid units when R and R^1 are combined is three.

4,043,995

PROCESS FOR CROSSLINKING HYDROPHILIC COLLOIDS

Rainer Kitzing, and Norman Alfred Smith, both of Ilford, England, assignors to Ciba-Geigy AG, Basel, Switzerland

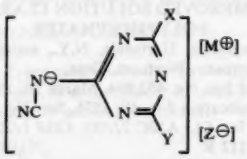
Filed May 19, 1975, Ser. No. 578,585

Claims priority, application United Kingdom, June 5, 1974, 24888/74; Oct. 25, 1974, 46165/74

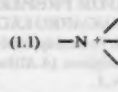
Int. Cl.² C09H *7/00*

U.S. Cl. 260—117 **12 Claims**

1. A process for crosslinking hydrophilic colloids which contain amino, imino and/or hydroxyl groups, which comprises incorporating into the hydrophilic colloid as a crosslinking agent a compound of the formula



wherein each of X and Y are a fluorine, chlorine or bromine atom or a hydroxy group, a lower alkoxy group or a radical of the formula



wherein R_1, R_2 and R_3 are each optionally substituted alkyl, alkenyl, alkinyl, cycloalkyl, aryl, aralkyl or together with the nitrogen atom to which they are bonded form a saturated or unsaturated ring which optionally contains yet other heteroatoms, and M is a cation and Z is an anion, one of which or neither may be required to balance the charge in the triazine ring system.

4,043,996

GELATIN MANUFACTURE-PEROXIDE LIQUEFACTION PROCESS

Thomas H. Donnelly, Western Springs, Ill., and Robert S. McGinnis, Florissant, Mo., assignors to Swift & Company, Chicago, Ill.

Filed Jan. 27, 1975, Ser. No. 544,415
Int. Cl.[2] C09H *3/00*
U.S. Cl. 260—118 **7 Claims**

1. A gelatin extraction process comprising the steps of: placing an uncured normally water-insoluble collagen-containing tissue in an aqueous hydrogen peroxide solution, said hydrogen peroxide being a sole lyotropic agent to effect liquefaction of said tissue; said liquefaction step being accomplished at a temperature within the approximate range of 45° to about 60° C. for about 7 to about 24 hours, the weight ratio of hydrogen peroxide to collagen within said uncured tissue being from about 1:3 to about 3:1; immobilizing said hydrogen peroxide; and drying the tissue liquefaction to recover gelatin.

4,043,997

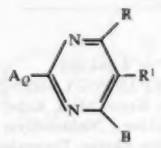
METHOD FOR ISOLATING ALBUMIN USING INSOLUBLE SUPPORTS COUPLED TO A DYE

Duane D. Schroeder, Orinda, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

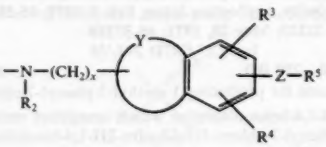
Filed May 28, 1976, Ser. No. 691,172
Int. Cl.[2] C07G *7/00*
U.S. Cl. 260—122 **16 Claims**

1. A process for selectively removing albumin from aqueous fluids containing the same comprising the step of:

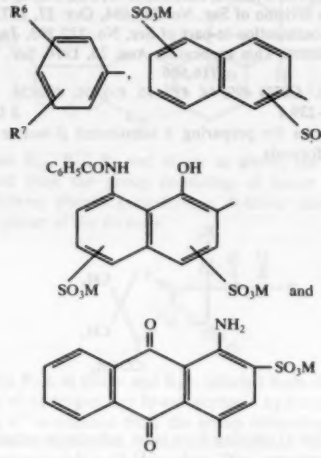
a. Contacting the albumin-containing fluid with a composition of the general formula



wherein A and B are different; wherein A is a support consisting of an insoluble polymer having hydroxyl groups and B is a dye having the formula



wherein R is halogen or lower alkyl; R^1 is hydrogen, SCH_3, halogen, or lower alkyl; R^2 is hydrogen or lower alkyl; R^3 and R^4 each are members of the group consisting of hydrogen, lower alkyl, lower alkoxy, hydroxy and $-SO_3M$; X is an integer from 0-1; Y is $-[H]_2$ or $-CH=CH-CH=CH-$; Z is $-NH-$ or $-N=M-$; R^5 is a substituted aryl selected from the group consisting of



wherein R^6 and R^7 each are members of the group consisting of hydrogen, lower alkyl, lower alkoxy, and $-SO_3M$; wherein M is hydrogen or alkali metal; and wherein Q is a weight ratio of the insoluble polymer to the remainder of the compound of between 1:1 and 50:1;

b. adsorbing the albumin on the composition, and

c. separating the composition on which the albumin is adsorbed from the aqueous phase.

4,043,998

1-(p-BENZENEDIAZONIUM)-ETHYLENEDIAMINE TETRAACETIC ACID

Claude F. Meares, Davis, Calif., and Michael W. Sundberg, Penfield, N.Y., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 513,420, Oct. 9, 1974, abandoned. This application Aug. 9, 1976, Ser. No. 712,534
Int. Cl.[2] C07C *113/04*; C07G *7/00*
U.S. Cl. 260—141 **1 Claim**

1. Salts of 1-(p-Benzenediazonium)-ethylenediaminetetraacetic acid in which the anion is the anion of a strong acid.

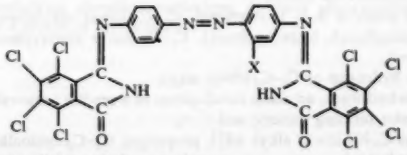
4,043,999

METHYL OR METHOXY SUBSTITUTED IMINOISOINDOLINONE PIGMENTS

Ernst Model, Basel, and Andre Pugin, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 287,314, Sept. 8, 1972, abandoned. This application Mar. 3, 1976, Ser. No. 663,329
Claims priority, application Switzerland, Sept. 27, 1971, 14052/71
Int. Cl.[2] C09B *43/00*
U.S. Cl. 260—152 **3 Claims**

1. A compound of the formula



wherein X is methyl or methoxy.

4,044,000

SUBSTITUTED β-LACTAM ANTIBIOTICS

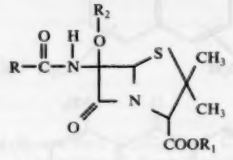
Gary A. Koppel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 545,451, Jan. 30, 1975, Pat. No. 3,994,885, which is a division of Ser. No. 301,694, Oct. 27, 1972, abandoned, Continuation-in-part of Ser. No. 222,293, Jan. 31, 1972, abandoned. This application Aug. 23, 1976, Ser. No. 716,606

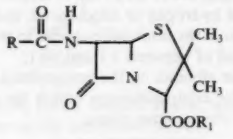
Int. Cl.[2] C07D *499/44, 499/46, 499/50, 499/58*

U.S. Cl. 260—239.1 **3 Claims**

1. The process for preparing a substituted β-lactam compound of the formula



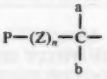
which comprises a) reacting in an inert, anhydrous solvent at a temperature between −90° and −15° C. a β-lactam ester of the formula



with between 2 and 6 equivalents per 1 equivalent of β-lactam ester of an alkali metal salt of the formula

$M^+ {}^-O—R_2$.

in the presence of an excess of the corresponding alcohol of the formula HOR_2; b) adding between 1 and 5 equivalents of a halogenating agent; c) acidifying said mixture; and d) recovering the substituted β-lactam ester from the reaction mixture; where in the preceding formulae R is hydrogen, C_1–C_6 alkyl, 4-amino-4-carboxybutyl, phenyl, substituted phenyl, or a group of the formula



wherein

P is phenyl, C_1–C_4 lower alkylphenyl, halophenyl, hydroxyphenyl, C_1–C_4 lower alkoxyphenyl, 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, or 1-tetrazyl;

Z is an oxygen atom, or a sulfur atom;

n is 0 or 1;

a is hydrogen or C_1–C_3 lower alkyl,

b is hydrogen, C_1–C_3 lower alkyl, protected hydroxy, amino, or protected amino;

and when n is 1, P is phenyl, C_1–C_4 lower alkylphenyl, halophenyl, hydroxyphenyl, C_1–C_4 lower alkoxyphenyl and

b is hydrogen or C_1–C_3 lower alkyl;

R_1 is hydrogen, an alkali metal cation or a readily removable ester forming moiety; and

R_2 is C_1–C_4 lower alkyl, allyl, propargyl, C_3–C_6 cycloalkyl, or benzyl.

4,044,001

PROCESS FOR PREPARING α-CHLORO-ε-CAPROLACTAM

Theodore Largman, Morris Township, and Stylianos Sifniades, Madison, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Sept. 2, 1976, Ser. No. 720,013

Int. Cl.[2] C07D *223/10*

U.S. Cl. 260—239.3 R **23 Claims**

1. A process for preparing α-chloro-ε-caprolactam which comprises reacting N-substituted-α-chloro-ε-caprolactam, wherein the N-substituent is an organic radical selected from the group consisting of aroyl, alkanoyl and arylsulfonyl radicals with ε-caprolactam at a temperature of about 50° to 250° C., thereby forming a reaction mixture containing α-chloro-ε-caprolactam and N-substituted-ε-caprolactam, and recovering the α-chloro-ε-caprolactam from the reaction mixture.

4,044,002

REDUCTION PROCESS FOR CEPHALOSPORIN SULFOXIDES

Lowell D. Hatfield, Bargersville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed June 9, 1976, Ser. No. 694,516

Int. Cl.[2] C07D *501/04*

U.S. Cl. 544—16 **23 Claims**

1. The process for reducing a cephalosporin sulfoxide to the corresponding cephalosporin which comprises reacting said sulfoxide in an inert solvent at a temperature between −25° C. and about 50° C. with at least 2 molar equivalents per mole of sulfoxide of an acyl bromide of the formula

wherein R_3 is C_1–C_{10} alkyl; C_1–C_{10} alkyl substituted by halogen, cyano, phenyl, C_1–C_4 alkoxy, or C_1–C_4 alkoxycarbonyl; phenyl, or phenyl substituted by halogen, cyano, nitro, C_1–C_4 alkyl, C_1–C_4 alkoxy, or C_1–C_4 alkoxycarbonyl; or R_3 is a cycloalkyl group having from 3 to 8 ring carbon atoms; in the presence of a bromine scavenger wherein said sulfoxide is a 3-cephem sulfoxide or a 3-exomethylenecepham sulfoxide.

4,044,003

PROCESS FOR PREPARING 1,4-BENZODIAZEPINES

Kikuo Ishizumi, Ikeda; Kazuo Mori, Kobe; Tadashi Okamoto, Ashiya; Takeshi Akase, Nishinomiya; Takahiro Izumi, Takarazuka; Mitsuhiro Akatsu, Toyonaka; Yoshiharu Kume; Shigeho Inaba, both of Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 223,303, Feb. 3, 1972, abandoned. This application July 24, 1975, Ser. No. 598,621

Claims priority, application Japan, Feb. 9, 1971, 46-5511; Apr. 6, 1971, 46-21523; May 28, 1971, 46-37196

Int. Cl.[2] C07D *243/16*

U.S. Cl. 260—239 BD **8 Claims**

1. A process for producing 1-methyl-5-phenyl-7-chloro-2,3-dihydro-1H-1,4-benzodiazepine which comprises reducing 1-methyl-5-phenyl-7-chloro-1,3-dihydro-2H-1,4-benzodiazepin-2-one with diborane.

4. A process for producing 1-methyl-5-phenyl-7-chloro-2,3,4,5-tetrahydro-1H-1,4-benzodiazepine which comprises reducing 1-methyl-5-phenyl-7-chloro-1,3-dihydro-2H-1,4-benzodiazepin-2-one with diborane with application of heat.

4,044,004

TOTAL STEROID SYNTHESIS EMPLOYING SUBSTITUTED ISOXAZOLE DERIVATIVES

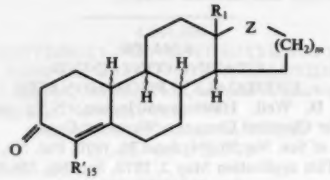
Gabriel Saucy, Essex Fells, and John William Scott, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 472,033, May 21, 1974, Pat. No. 3,984,428, which is a division of Ser. No. 278,889, Aug. 9, 1972, abandoned, which is a division of Ser. No. 39,560, May 21, 1970, Pat. No. 3,691,190, which is a continuation-in-part of Ser. No. 778,314, Nov. 22, 1968, Pat. No. 3,700,661. This application June 14, 1976, Ser. No. 695,610

Int. Cl.[2] C07J *43/00*

U.S. Cl. 260—239.55 C 3 Claims

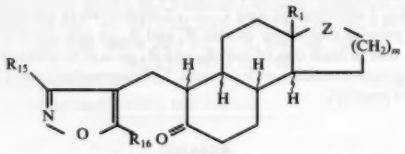
1. A process for the preparation of a steroidal compound of the formula



wherein R'_{15} is hydrogen or lower alkyl; Z is selected from the group consisting of carbonyl, lower alkylenedioxymethylene, di-lower alkoxymethylene, phendioxymethylene and a group of the formula

wherein R_7 is selected from the group consisting of hydrogen, lower alkyl, lower alkoxy-lower alkyl, phenyl-lower alkyl, tetrahydropyranyl and lower acyl; R_8 is selected from the group consisting of hydrogen and lower alkyl; the configuration is trans-anti-trans-anti; R_1 is a primary alkyl group of from 1 to 5 carbons and *m* is 1 or 2

which comprises treating a starting reactant of the formula

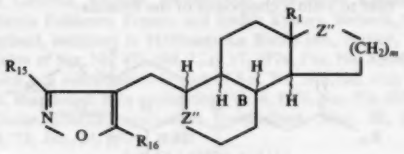


wherein R_{15} and R_{16} are hydrogen or lower alkyl, with the proviso that when R_{15} is lower alkyl, R_{16} equals R_{15}, when R_{16} is hydrogen, R_{15} is lower alkyl and when R_{15} is hydrogen, R_{16} is lower alkyl; Z is selected from the group consisting of carbonyl, lower alkylenedioxymethylene, di-lower alkoxymethylene, phendioxymethylene and a group of the formula

wherein R_7 is as above; R_8 is selected from the group consisting of hydrogen and lower aliphatic hydrocarbyl; the configuration is trans-anti-trans; and R_1 and *m* are as above

in the following manner;

a. converting the free carbonyl group or groups of the starting reactant to a derivative of the formula

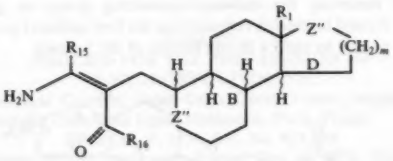


wherein R_{15}, R_{16}, R_1 and *m* are as above, the D-ring Z″ is selected from the group consisting of lower alkylenedioxymethylene, phendioxymethylene, di-lower alkoxymethylene and a group of the formula

wherein R_7 is as above and R_8 is selected from the group consisting of hydrogen and lower aliphatic hydrocarbyl; and the B-ring Z″ is selected from the group consisting of lower alkylenedioxymethylene, phendioxymethylene, di-lower alkoxymethylene and a group of the formula

wherein R_7 is as above and R_8 is selected from the group consisting of hydrogen;

b. contacting the protected carbonyl compound of step (a) with hydrogen to yield a vinylogous amide of the formula

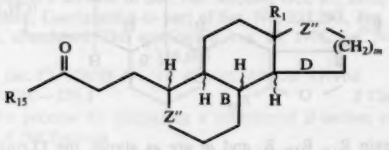


wherein R_{15}, R_{16}, R_1 and *m* are as above, the D-ring Z″ is selected from the group consisting of lower alkylenedioxymethylene, phendioxymethylene, di-lower alkoxymethylene and a group of the formula

wherein R_7 is as above and R_8 is selected from the group consisting of hydrogen and lower alkyl; and the B-ring Z″ is selected from the group consisting of lower alkylenedioxymethylene, phendioxymethylene, di-lower alkoxymethylene and a group of the formula

wherein R_7 is as above and R_8 is selected from the group consisting of hydrogen;

c. contacting the vinylogous amide of step (b) with aqueous base to yield a compound of the formula

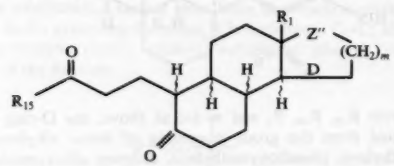


wherein R_{15}, R_1 and *m* are as above, the D-ring Z″ is selected from the group consisting of lower alkylenedioxymethylene, phendioxymethylene, di-lower alkoxymethylene and a group of the formula

wherein R_7 is selected from the group consisting of hydrogen, lower alkyl, lower alkoxy-lower alkyl, phenyl-lower alkyl and tetrahydropyranyl and R_8 is selected from the group consisting of hydrogen and lower alkyl; and the B-ring Z″ is selected from a group consisting of lower alkylenedioxymethylene, phendioxymethylene, di-lower alkoxymethylene and a group of the formula

wherein R_7 is as above and R_8 is selected from the group consisting of hydrogen; and

d. removing the carbonyl protecting group or groups formed in step (a), regenerating the free carbonyl group or groups to yield a B-ring ketone of the formula



wherein R_{15}, R_1, *m* and the D-ring Z″ are as above, cyclizing the B-ring ketone and recovering the steroid.

4,044,005

PEROXIDES OF 2-OXO-CYCLOPENTA[b]FURANS

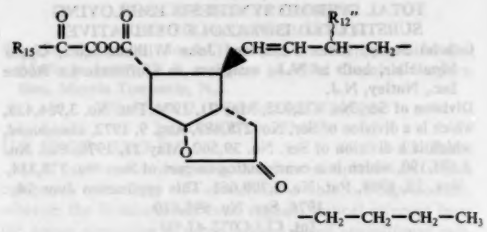
Frank Kienzle, Therwil, Switzerland, and Perry Rosen, North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 613,137, Sept. 15, 1975, Pat. No. 4,005,110, which is a division of Ser. No. 381,322, July 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 300,633, Nov. 25, 1972, abandoned. This application Oct. 6, 1976, Ser. No. 730,036

Int. Cl.[2] C07C *177/00;* **C07D** *307/77, 309/04*

U.S. Cl. 542—426 **3 Claims**

1. A compound for the formula:



wherein R_{15} is the source of variation which distinguishes one peracid from another; and R_{12}″ is hydroxy protected with a hydrolyzable ester of ether;

or enantiomer and racemate thereof.

4,044,006

OXAZINE CONTAINING UREIDOALKYLPHOSPHONATES

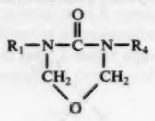
Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 50,304, June 26, 1970, Pat. No. 3,763,281. This application May 2, 1973, Ser. No. 356,526

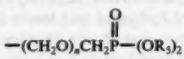
Int. Cl.[2] C07D *273/04*

U.S. Cl. 544—67 **2 Claims**

1. Ureidoalkylphosphonates corresponding to the formula:



wherein R_1 and R_4 are selected from the group consisting of hydrogen, hydroxymethyl, C_1-C_{12} alkoxymethyl, and a phosphonate group Z where Z corresponds to the formula:



in which *n* is an integer having a value of from 0 to 1 and R_5 is selected from the group consisting of C_1-C_{12} alkyl, allyl, C_2-C_{12} 2-chloroalkyl, and C_2-C_{12} 2-hydoxyalkyl groups, with the proviso that either of said R_1 and R_4 groups are Z groups and that at least one of said R_1 and R_4 groups is selected from the group consisting of hydrogen, hydroxymethyl, and C_1-C_{12} alkoxymethyl.

4,044,007

STABILIZATION OF BIOCIDAL COMPOSITION

William L. Howard, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 591,201, June 27, 1975, abandoned, which is a continuation of Ser. No. 869,902, Oct. 27, 1969, abandoned. This application Nov. 18, 1976, Ser. No. 742,825

Int. Cl.[2] C07D *295/02*

U.S. Cl. 544—185 **7 Claims**

1. A substantially water-free composition consisting essentially of

a. from about 10 to about 95 weight percent of an adduct of hexamethylenetetramine and an olefinic halide or acetylenic halide having two to eight carbon atoms, selected from the group consisting of a dihaloalkene and a haloalkyne, the halogen of which has an atomic number from 17 to 53 inclusive, and

b. from about 90 to about 5 weight percent of a suppressor

additive, said additive being a compound which undergoes an endothermic change at a temperature below that at which spontaneous exothermic decomposition of said adduct is initiated, wherein the suppressor additive is

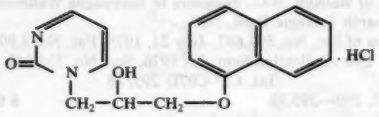
a. a polymeric form of formaldehyde or acetaldehyde,
b. an alkali metal- or ammonium hydrogen carbonate,
c. an alkali metal- or ammonium salt of a polycarboxylic lower alkylene acid having a total of 2 to 8 carbon atoms,
d. urea,
e. biuret or
f. triuret.

4,044,008
1-[2-HYDROXY-3-(2-NAPHTHOXY)PROPYL]-2(1H)PYRIMIDONE HYDROCHLORIDE

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Oct. 6, 1976, Ser. No. 730,195
Int. Cl.[2] C07D *239/10*
U.S. Cl. 260—251 R 2 Claims

1. A compound of the formula:

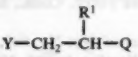


4,044,009
PYRIMIDINE ALCOHOLS AND DERIVATIVES THEREOF

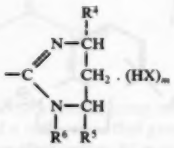
Hans Peter Panzer, Stamford; Michael Niall Desmond O'Connor, Norwalk, and Louis J. Baccei, Hartford, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 467,332, May 6, 1974, Pat. No. 4,007,200. This application July 16, 1976, Ser. No. 706,086
Int. Cl.[2] C07D *239/06*
U.S. Cl. 260—251 R 17 Claims

1. A compound having the formula



wherein Y is hydroxyl or R^2O, R^2 being alkyl (C_1-C_{10}), aryl (C_6-C_{10}) or aralkyl (C_7-C_{11}), R^1 is hydrogen, methyl or phenyl and Q is



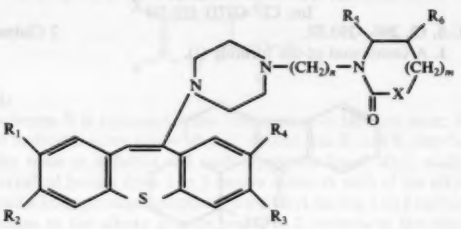
wherein *m* is 0 or 1, X is a halogen, and R^4, R^5 and R^6 are, individually, hydrogen, alkyl (C_1-C_4), aryl (C_6-C_{10}), aralkyl (C_7-C_{11}) or alkaryl (C_7-C_{11}).

4,044,010
DIBENZO[b,f] THIEPINS BEARING PIPERAZINYL SUBSTITUTION

Max Gerecke, Reinach, Switzerland; Jean-Pierre Kaplan, Le Plessis Robinson, France, and Emilio Kyburz, Reinach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 471,094, May 17, 1974, Pat. No. 3,954,764, which is a continuation-in-part of Ser. No. 378,732, July 12, 1973, abandoned. This application Feb. 4, 1976, Ser. No. 655,183
Claims priority, application Switzerland, Mar. 30, 1973, 4605/73; Jan. 14, 1974, 74448
Int. Cl.[2] C07D *413/14*
U.S. Cl. 260—268 TR 6 Claims

1. A compound of the formula



wherein one of R_1 and R_2 is hydrogen and the other is methyl, methoxy, methylthio, dimethylsulfamoyl, chloro, fluoro or trifluoromethyl; one of R_3 and R_4 is hydrogen and the other is methyl, methoxy, methylthio, dimethylsulfamoyl, chloro, fluoro or trifluoromethyl; *n* is 2; *m* is 0; X is oxygen, and R_5 and R_6 are hydrogen or taken together are the group

or a salt thereof with a pharmaceutically acceptable acid.

4,044,011
PROCESS FOR THE PREPARATION OF 8-HYDROXYQUINOLINE

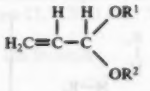
Jean-Marie Cognion, Saint Genis Laval, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Oct. 9, 1975, Ser. No. 621,024
Claims priority, application France, Oct. 14, 1974, 74.34398
Int. Cl.[2] C07D *215/24*
U.S. Cl. 260—289 XA 14 Claims

1. In a process for the preparation of 8-hydroxyquinoline by reacting o-aminophenol, o-nitrophenol, and acrolein or an allylidene diacetal or diester, the improvement which comprises the steps of:

a. forming a first solution of o-nitrophenol in acrolein or an acrolein derivative having the formula

(I)



wherein R^1 and R^2 are the same or different lower alkyl or lower alkanoyl group of 1–3 carbon atoms;

b. forming a second solution of o-aminophenol in an aqueous solution of a mineral acid selected from the group of hydrochloric acid, phosphoric acid and sulfuric acid or a mixture of said mineral acid and a lower mono-alkanoic acid;

c. gradually adding the solution from step (a) to the solution

from (b), at a temperature of from about 90°to 120° C thereby causing the mixture to react to form 8-hydroxyquinoline; and

d. separating the 8-hydroxyquinoline from the reaction mixture.

4,044,012

INDOLO-QUINOLIZIDINE DERIVATIVES

Csaba Szantay; Lajos Szabo; Gyorgy Kalaus; Egon Karpati, and Laszlo Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Division of Ser. No. 575,038, May 6, 1975. This application Mar. 25, 1976, Ser. No. 670,243

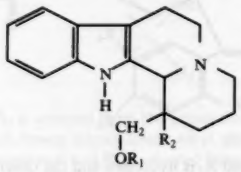
Claims priority, application Hungary, May 7, 1974, RI 536

Int. Cl.[2] C07D *459/00*

U.S. Cl. 260—293.53 **2 Claims**

1. A compound of the formula (I),

(I)



wherein R_1 stands for hydrogen, and R_2 stands for an alkyl group having 1 to 4 carbon atoms, the optically active enanthiomers and the pharmaceutically acceptable salts thereof.

4,044,013

1,2-DIALKYLPYRAZOLIUM COMPOUNDS HAVING 3-(OR 3,5-) NITROGEN-CONTAINING HETEROCYCLIC GROUP

Barrington Cross, Rocky Hill, and Bryant Leonidas Walworth, Pennington, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

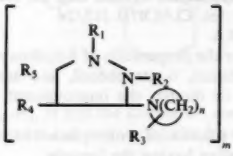
Division of Ser. No. 574,795, May 5, 1975, abandoned. This application May 5, 1976, Ser. No. 683,562

Int. Cl.[2] C07D *401/04, 403/04*

U.S. Cl. 260—293.63 **8 Claims**

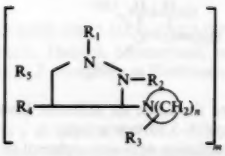
1. A compound having a formula selected from the group consisting of:

(I)



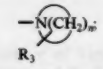
and

(II)



wherein R_1 and R_2 each represents alkyl (C_1–C_4); R_3 represents a member selected from the group consisting of hydrogen alkyl (C_1–C_3), alkoxy (C_1–C_3), phenyl, benzyl, cyano, carboxamido and carboxy; R_4 represents a member selected from the group consisting of hydrogen, alkoxy (C_1–C_4) and halogen; R_5 represents a member selected from the group consisting of

cyclohexyl and



Y and Z each independently represents a member selected from the group consisting of hydrogen, halogen, methyl and -alkoxy (C_1–C_4); X represents a non-phytotoxic anion with a charge of 1 to 3; *n* represents an integer from 4 to 6; *m* represents an integer from 1 to 2; and HB is an inorganic acid.

8. The compound according to claim **1** wherein the compound is: 4-bromo-1,2-dimethyl-3,5-dipiperidinopyrazolium bromide, hydrobromide.

4,044,014

SULFIDE COMPOUNDS

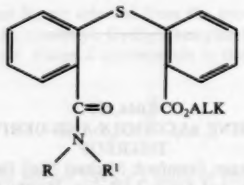
Nariman Bomanshaw Mehta, and Lawrence Edward Brieaddy, both of Raleigh, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 597,697, July 21, 1975, Pat. No. 3,997,540. This application Sept. 23, 1976, Ser. No. 726,049

Int. Cl.[2] C07D *295/16*

U.S. Cl. 260—293.73 **6 Claims**

1. The compound of the formula



where R and R^1 taken together are $(CH_2)_x$ where *x* is 4 or 5 and ALK is alkyl of 1 to 4 carbon atoms.

4,044,015

IMIDAZOPYRIDINIUM COMPOUNDS AS HYPOGLYCEMIC AGENTS

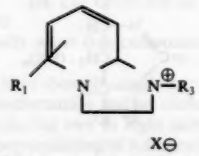
Donald E. Kuhla, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 609,914, Sept. 3, 1975, abandoned. This application Aug. 6, 1976, Ser. No. 712,204

Int. Cl.[2] C07D *487/00*

U.S. Cl. 260—294.8 C **20 Claims**

1. A compound selected from the group consisting of:



wherein R_1 is hydrogen, chlorine, methoxy or benzyloxy; R_3 is benzyl, α-naphthylmethyl, β-naphthylmethyl, β-

phenethyl, or substituted benzyl wherein the substituent is chloro, fluoro, bromo, dichloro, trifluoromethyl, cyano, methylsulfonyl, sulfamoyl, dimethylsulfamoyl, carbethoxy, phenyl or methoxy; and X is a pharmaceutically acceptable anion.

4,044,016

PREPARATION OF TRIAZOLO BENZODIAZEPINES AND NOVEL COMPOUNDS

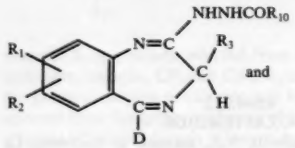
Leo Henryk Sternbach, Upper Montclair, and Armin Walser, West Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 540,626, Jan. 13, 1975, Pat. No. 3,970,664. This application May 7, 1976, Ser. No. 684,435

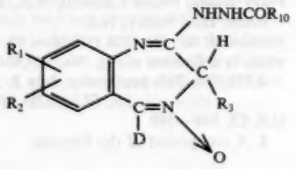
Int. Cl.[2] C07D *213/24;* A61K *31/44*

U.S. Cl. 260—295 F **1 Claim**

1. A compound selected from the group consisting of



and



wherein D is a 2-pyridyl group; R_2 and R_3 are hydrogen; R_1 is hydrogen or halogen and R_{10} is methyl.

4,044,017

SUBSTITUTED PHENYL KETONES

Cedric Herbert Hassall, Welwyn; William Henry Johnson, Hitchin; Antonin Krohn, London; Carey Ernest Smithen, Welwyn, and William Anthony Thomas, Huntingdon, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

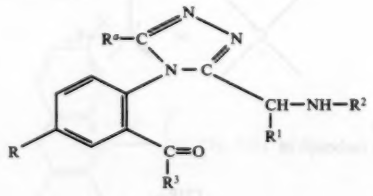
Division of Ser. No. 605,580, Aug. 18, 1975, Pat. No. 4,007,219. This application Nov. 11, 1976, Ser. No. 740,894

Claims priority, application United Kingdom, Aug. 20, 1974, 36567/74; May 21, 1975, 21321/75; Aug. 11, 1975, 36567/75

Int. Cl.[2] C07D *249/06;* A61L *31/44*

U.S. Cl. 260—295 AM **1 Claim**

1. A compound of the general formula



wherein R is selected from the group consisting of a halogen atom, nitro and a trifluoromethyl group; R^1 is a hydrogen atom or a lower alkyl group; R^2 is an acyl group derived from a naturally occurring amino acid; R^3 is a 2-pyridyl group; and R^a is selected from the group consisting of a hydrogen atom, lower alkyl or a hydroxymethyl group and the acid addition salts thereof.

4,044,018

ISOXAZOLONE DERIVATIVES, THEIR PREPARATION AND THEIR USE AS PLANT GROWTH REGULATORS

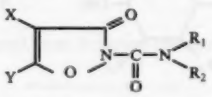
Kazuo Tomita, Yokosuka; Tadashi Murakami, Tokyo; Yoshio Yamazaki, and Toyokuni Honma, both of Nozu, all of Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 498,617, Aug. 19, 1974, abandoned, which is a continuation of Ser. No. 308,942, Nov. 24, 1972, abandoned. This application Oct. 23, 1974, Ser. No. 517,298

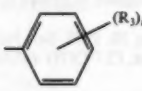
Int. Cl.[2] C07D *261/12*

U.S. Cl. 260—307 A **14 Claims**

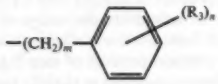
1. A compound having the formula



wherein X is hydrogen atom, lower alkyl or halogen atom; Y is hydrogen atom, lower alkyl or phenyl; and R_1 and R_2 may be the same or different and each represents lower alkyl, dialkoxyalkyl having from 1 to 3 carbon atoms in each of the alkyl and alkoxy portions, alkoxycarbonylalkyl having 1 to 4 carbon atoms in the alkoxy portion and 1 to 2 carbons in the alkyl portion, cycloalkyl having from 5 to 7 carbon atoms, alkenyl having from 3 to 5 carbon atoms, alkynyl having from 3 to 4 carbon atoms, lower alkoxy, substituted phenyl having the formula



wherein R_3 is lower alkyl, halogen, lower alkoxy, alkoxycarbonyl having 1 to 4 carbon atoms in the alkoxy portion, nitro or trifluoromethyl, and n is an integer from 0 to 3 and R_3 may be the same or different, or substituted aralkyl having the formula



wherein *m* is 1 or 2 and R_3 and n are as defined above.

4,044,019

HYDROXYPHENYLATED HYDANTOINS

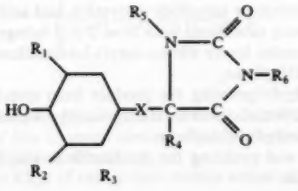
Andreas Schmidt, Reinach, Switzerland; Janet B. Peterson, Yonkers, and Martin Dexter, Briarcliff Manor, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 469,717, May 14, 1974, Pat. No. 3,939,175, which is a continuation-in-part of Ser. No. 357,744, May 7, 1953, abandoned. This application Sept. 17, 1975, Ser. No. 614,039

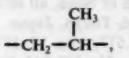
Int. Cl.[2] C07D *233/78*

U.S. Cl. 548—313 **9 Claims**

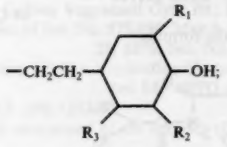
1. A compound of the formula



wherein R_1 and R_2 independently of one another denote alkyl with 1 to 4 carbon atoms, R_3 denotes hydrogen, X denotes a direct bond,



R_4 denotes alkyl with 1 to 17 carbon atoms or a group



R_5 denotes hydrogen as alkyl with 1 to 18 carbon atoms, and R_6 denotes alkyl with 1 to 18 carbon atoms.

4,044,020

PROCESS FOR PREPARING BIOTIN

Michael Marx, Sunnyvale, Calif., and Josef H. Reisdorff, Wuppertal, Germany, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed June 30, 1975, Ser. No. 591,597
Int. Cl.[2] C07D *495/04*
U.S. Cl. 548—303 **3 Claims**

1. The process of preparing biotin which comprises
a. ozonizing a lower alkoxycyclohexene to form the lower alkyl ester of 6-oxohexanoic acid;
b. reacting nitromethane with the lower alkyl ester of 6-oxohexanoic acid from step (a) under basic conditions in the presence of a solvent suitable for nitromethylation to form the lower alkyl ester of 7-nitro-6-hydroxy-heptanoic acid;
c. reacting the product of step (b) with a lower alkanoic acid or its halide or anhydride derivative to form the lower alkyl ester of 7-nitro-6-lower alkanoyl -heptanoic acid;
d. placing the reaction product of step (c) in a suitable solvent under basic conditions at slightly raised temperatures to form the lower alkyl ester of 7-nitrohept-6-enoic acid;
e. reacting nitroethanethiol with the reaction product from step (d) in an inert atmosphere, in a solvent and under conditions suitable for nucleophilic addition to form the lower alkyl ester of dl-7-thio-6-nitromethyl-9-nitrononanoic acid;
f. reactively contacting the reaction product of step (e) with a catalytic amount of a tertiary alkyl amine and phosphorus oxychloride under substantial anhydrous conditions in a substantially inert atmosphere in a suitable solvent to form dl-6-(4-carbo lower alkoxy-butyl)-4H-6H-thieno [3,4-d]-furoxan;
g. reducing the product from step (f) by catalytic hydrogenation or by using a suitable reducing agent and acylating with a suitable carboxylic acid of one to four carbon atoms or its acid chloride or anhydride derivative, said acid or its derivative being substituted with from 0 to 3 halogens, to form dl-2(4-carbo lower alkoxy-butyl)-3,4-bis(alkamido)-2,5-dihydro-thiophene;
h. selectively hydrogenating the product from step (g) to form dl-cis-2(4-carbo lower alkoxy-butyl)-3,4-cis-bis(alkamido)-tertrahydro-thiophene;
i. hydrolyzing and cyclizing the product from step (h) to form dl-biotin.

4,044,021

TETRASUBSTITUTED IMIDAZOLIDINE DIURETICS USEFUL IN THE TREATMENT OF HYPERALDOSTERONISM

John William Hanifin, Jr.; Robert Zalmon Gussin, both of Suffern, and Elliott Cohen, Pearl River, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 191,470, Oct. 21, 1971, abandoned. This application Oct. 2, 1972, Ser. No. 293,874
Int. Cl.[2] C07D *233/88*
U.S. Cl. 548—312 **6 Claims**

1. 1-(p-chlorophenyl)-2-imino-3-methyl-4-oxoimidazolidine.

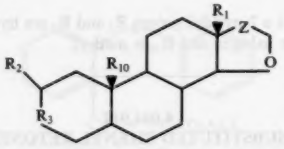
4,044,022

15-OXASTEROIDS

Perry Rosen, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 528,115, Nov. 29, 1974, Pat. No. 3,987,066, which is a division of Ser. No. 217,956, Jan. 14, 1972, Pat. No. 3,872,076. This application July 2, 1976, Ser. No. 702,265
Int. Cl.[2] C07D *231/54*
U.S. Cl. 548—369 **3 Claims**

1. A compound of the formula

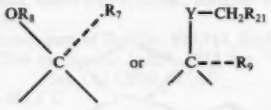


wherein

R_1 is lower alkyl of from 1 to 5 carbon atoms;

where

R_2 and R_3 taken together with carbon atoms 2 and 3 of the steroid nucleus represent a 5-membered pyrazole ring wherein one heteroatom is attached to carbon atom 3; R_{10} is hydrogen or methyl; and Z is one of the groups carbonyl, ketal protected carbonyl,



where

Y is carbonyl or

R_7 is hydrogen, lower alkyl, lower alkenyl or lower alkynyl; R_8 is hydrogen, lower alkyl, cycloalkyl, lower alkanoyl or aroyl; R_9 is hydrogen, hydroxy, or lower alkanoyloxy; R_{20} is hydroxy or lower alkanoyloxy; and R_{21} is hydrogen, hydroxy, lower alkanoyloxy or halogen.

4,044,023

NOVEL BASIC SUBSTITUTED-ALKYLIDENAMINO-OXYLALKYLCARBOXYLIC-ACID ESTERS

Jan Van Dijk, and Johannes Maria Antonius Zwagemakers, both of van Houtenlaan, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

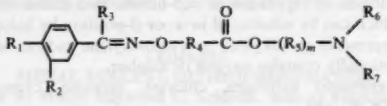
Division of Ser. No. 151,793, June 10, 1971, Pat. No. 3,853,955. This application Sept. 27, 1974, Ser. No. 509,807

Claims priority, application Netherlands, Mar. 2, 1971, 7008493

Int. Cl.[2] C07D *207/12*

U.S. Cl. 260—326.47 4 Claims

1. A compound selected from the group consisting of the amines of the formula:



wherein R_1 is a moiety selected from the group consisting of hydrogen, halogen, CF_3 and CH_3, R_2 is a moiety selected from the group consisting of chlorine and hydrogen, R_3 is a moiety selected from the group consisting of hydrogen and CH_3, R_4 is alkylene of up to 5 carbon atoms, m is 0 or 1, R_5 is alkylene of up to 6 carbon atoms which may be substituted by phenyl, R_6 together with R_7 and N to which they are both attached forming a cyclic moiety selected from the group consisting of pyridyl and alkyl derivatives of said pyridyl and the acid addition salts thereof with pharmaceutically acceptable acids.

4,044,024

THIAXANTHENE DERIVATIVES

Jorn Lasse Martin Buus, Bjaeverskov; Niels Lassen, Gentofte, and Allan Johan Bigler, Copenhagen, all of Denmark, assignors to Kefalas A/S, Denmark

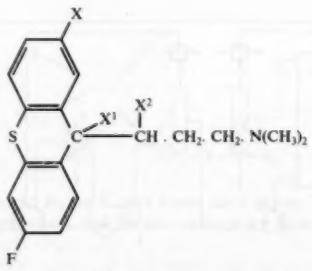
Continuation-in-part of Ser. No. 421,279, Dec. 3, 1973, abandoned. This application July 7, 1975, Ser. No. 593,559

Claims priority, application United Kingdom, Dec. 8, 1972, 56910/72

Int. Cl.[2] C07D *335/20*

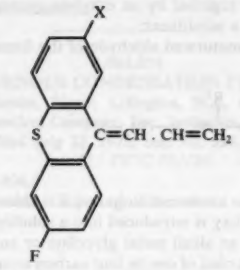
U.S. Cl. 260—328 4 Claims

1. A compound of formula



wherein X is selected from the group consisting of $—CF_3$ and $—SO_2.N(CH_3)_2$, and X^1 and X^2 form together a single bond.

2. A compound of the formula



wherein X is selected from the group consisting of $—CF_3$ and $—SO_2.N(CH_3)_2$.

4,044,025

ORGANOTIN MITICIDAL AND INSECTICIDAL COMPOUNDS

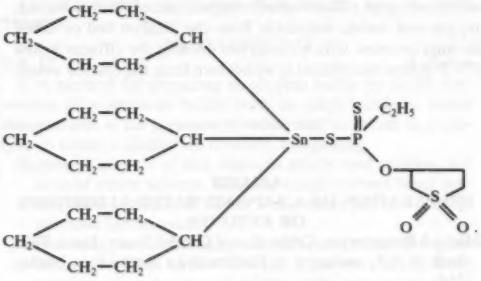
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 644,703, Dec. 29, 1975, Pat. No. 4,012,421, which is a division of Ser. No. 482,033, June 24, 1974, which is a division of Ser. No. 293,974, Oct. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 208,046, Dec. 10, 1971, abandoned. This application Sept. 27, 1976, Ser. No. 726,890

Int. Cl.[2] C07D *333/48*

U.S. Cl. 260—332.1 1 Claim

1. A compound of the formula



4,044,026

SUBSTITUTED SUCCINALDEHYDE MONOACETALS

Joachim Paust, Neuhofen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Rhine, Germany

Filed Nov. 13, 1974, Ser. No. 523,442

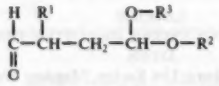
Claims priority, application Germany, Nov. 24, 1973, 2358690

Int. Cl.[2] C07C *45/00, 47/02*

U.S. Cl. 260—340.9 R 2 Claims

1. 2-Methyl-4-methoxy-4-phenoxybutanal.

2. A process for the production of a succinaldehyde monoacetal of the formula (I):



(I)

in which

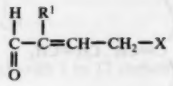
R^1 is hydrogen, alkyl of one to 10 carbon atoms, cycloalkyl of five to seven carbon atoms, phenyl, or phenyl bearing alkyl as a substituent;

R^2 is alkyl of one to four carbon atoms or phenyl;

R^3 is alkyl of one to four carbon atoms; and

R^2 and R^3 may together by an ethylene group which may bear alkyl as a substituent;

wherein an α,β-unsaturated aldehyde of the formula (II):



(II)

in which R^1 has the above meanings and X is chlorine, bromine or methylsulfonyloxy is introduced into a solution of an alkali metal alcoholate, an alkali metal glycolate or an alkali metal phenolate in an alcohol of one to four carbon atoms so that the temperature of the reaction mixture does not rise substantially above 50° C and the reaction mixture is allowed to complete the reaction.

4,044,027

MALEIC ANHYDRIDE PROCESS

Robert G. Anderson, San Rafael; Alan E. Straus, El Cerrito, and John B. Wilkes, Richmond, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 27, 1976, Ser. No. 718,235

Int. Cl.² C07D *307/60*

U.S. Cl. 260—346.75 **11 Claims**

1. In a process for the conversion of normal butane to maleic anhydride at a pressure between about 15 and 100 psig and a temperature above 675° F, by contacting the normal butane with oxygen-containing gas an an oxidation catalyst disposed in a fixed catalyst bed or set of tubes in a reactor vessel, and withdrawing an effluent comprising unreacted normal butane, oxygen and maleic anhydride from the catalyst bed or tubes, the improvement which comprises cooling the effluent below 675° F before the effluent is withdrawn from the reactor vessel.

4,044,028

PREPARATION OF α,β-UNSATURATED ALDEHYDES OR KETONES

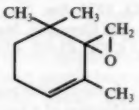
Michael Rosenberger, Caldwell, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 468,836, May 10, 1974, Pat. No. 4,000,131. This application Sept. 15, 1976, Ser. No. 723,375

Int. Cl.² C07D *303/06*

U.S. Cl. 260—348 R **1 Claim**

1. A compound of the formula:



4,044,029

AMINO-ANTHRAQUINONE REACTIVE DISPERSE DYES

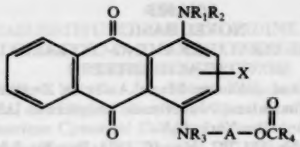
Stefan Koller, Ramlinsburg; Urs Karlen, Magden; Werner Kneubühler, Bockten, and Raymond Defago, Riehen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed May 26, 1976, Ser. No. 689,985

Int. Cl.² C09B *1/16, 1/40*

U.S. Cl. 260—376 **5 Claims**

1. Reactive disperse dyes of the formula (1)



(I)

wherein

R_1 represents hydrogen or alkyl,

R_2 represents hydrogen, alkyl, cycloalkyl, aralkyl or substituted or unsubstituted phenyl,

R_3 represents hydrogen or alkyl,

R_4 represents an alkyl radical of 1 to 6 carbon atoms which is substituted in α-position, or in α- and β-position, by halogen, or represents an α,β-unsaturated alkene radical which can be substituted in α- or β-position by halogen;

A represents an alkylene or cycloalkylene radical which optionally contains oxygen or sulphur,

X represents hydrogen, chlorine, bromine, cyano or $COOR_5$, and

R_5 represents alkyl.

4,044,030

PROCESS FOR THE MANUFACTURE OF N-ALKYLAMINO- AND N,N-DIALKYLAMINOANTHRAQUINONES

Zdenek Seha, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 20, 1976, Ser. No. 688,517

Claims priority, application Switzerland, May 23, 1975, 6665/75

Int. Cl.² C09B *1/16, 1/20*

U.S. Cl. 260—378 **6 Claims**

1. A process for the manufacture of N-alkylamino- and N,N-dialkylaminoanthraquinone from the corresponding nitroanthraquinones, which comprises reacting substituted or unsubstituted nitroanthraquinones or dinitroanthraquinones with at least twice the molar amount, referred to the nitro groups to be reacted, of an alkyl acid amide, at temperatures between 100° C and the boiling point of the alkyl acid amide.

4,044,031

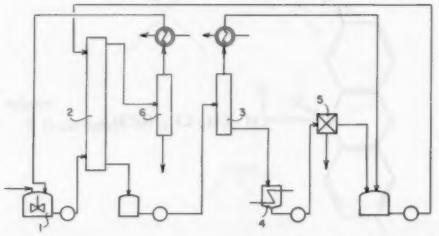
PROCESS FOR THE SEPARATION OF STEROLS

Åke Allan Johansson, Laivastokatu 4 B 23, 00160 Helsinki 16; Riitta Helena Kristiina Kivikari, Puistokaari 15 A 11, 00200 Helsinki 20, and Elias Uolevi Suokas, Kimmeltie 26 D 29, 02100 Espoo 10, all of Finland

Filed July 2, 1976, Ser. No. 702,118

Int. Cl.² C07J *9/00*

U.S. Cl. 260—397.25 **7 Claims**



1. A process for the separation of sterols or mixtures of sterols from mixtures of unsaponifiables obtained from crude soap skimmings, soap of vegetable oil, tall oil, animal fat or the like, comprising the steps of:

1. dissolving the mixture of unsaponifiables in a water immiscible mixture of solvents containing
   30 – 100% by weight of hexane
   0 – 50% by weight of acetone
   0 – 50% by weight of methanol,
2. extracting from the solution obtained the polar components including the sterols into a mixture of
   0 – 99.9% by weight of methanol
   0 – 50% by weight of hexane
   0 – 50% by weight of acetone
   0.1 – 10% by weight of water
   0 – 10% by weight of unsaponifiables other than sterols,
3. separating the hydrophilic methanol phase,
4. concentrating the separated hydrophilic phase by evaporation, and
5. crystallizing the sterols by cooling the solution.

4,044,032

METAL DIALKYL DITHIOPHOSPHATES

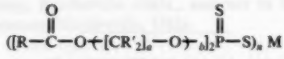
Morris A. Wiley; Raymond C. Schlicht, both of Fishkill, and James O. Waldbillig, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 443,567, Feb. 19, 1974, Pat. No. 3,944,495. This application Aug. 27, 1975, Ser. No. 608,114

Int. Cl.[2] C08H *3/00*; C07F *3/06*

U.S. Cl. 260—399 **4 Claims**

1. An alkyl dithiophosphate represented by the formula:



wherein

R is a straight-chain aliphatic group containing from about 4 to 30 carbon atoms;

R′ is selected from a hydrogen, alkyl and aryl group;

M is zinc;

a is an integer of from about 2 to about 12;

b is an integer of from about 1 to about 10;

n is an integer corresponding to the valence of M.

4,044,033

HIGH TEMPERATURE LUBRICANT

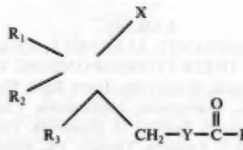
Anthony M. Fusco, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Apr. 14, 1975, Ser. No. 568,047

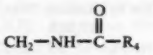
Int. Cl.[2] C07C *103/127, 103/133*

U.S. Cl. 260—404 **7 Claims**

1. A high temperature lubricant comprising a gem disubstituted alicyclic compound in which the ring portion of said compound is cycloaliphatic hydrocarbyl and contains from about 5 and 7 carbon atoms and said compound is represented by the formula



wherein R_1 and R_2 are H or a lower alkyl group, X is a polyalkyleneoxy chain, and the gem radicals are R_3 and



wherein R_3 is an alkyl group containing 1 to about 6 carbon atoms and R_4 is an alkyl or alkylene group containing about 3 to about 20 carbon atoms.

4,044,034

NITROGENOUS CONDENSATION PRODUCTS

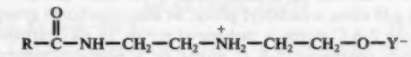
Arvid Christiansen, North Arlington, N.J., assignor to The Miranol Chemical Company, Inc., Irvington, N.J.

Filed July 22, 1975, Ser. No. 598,092

Int. Cl.[2] C07C *101/26*

U.S. Cl. 260—404.5 **5 Claims**

1. A nitrogenous compound of formula:



wherein Y is a saturated residue of an α, β-unsaturated dicarboxylic acid of 4 or 5 carbon atoms wherein the carboxylic acid groups are an adjacent carbon atoms and the double bond is between the two carbon atoms or immediately adjacent to one of them and wherein one of the carboxylic acid groups may be neutralized with a base or esterified with an alcohol of 1–6 carbon atoms and R is an alkyl or alkenyl group of 5–25 carbon atoms.

4,044,035

METHOD FOR THE PREPARATION OF ALKYL TIN HALIDES

Eric J. Bulten, Bilthoven, and Francois Verbeek, Harmelen, both of Netherlands, assignors to Commer S.r.l., Lodi (Mi), Italy

Filed Mar. 26, 1976, Ser. No. 670,823

Claims priority, application Netherlands, Apr. 4, 1975, 7504073

Int. Cl.[2] C07F *7/22*

U.S. Cl. 260—429.7 **5 Claims**

1. A method for preparing an alkyltin halide by direct conversion of a stannous halide with an alkyl halide at raised temperatures in the presence of iodine and/or iodide as a catalyst, to obtain a dialkyl tin dihalide, comprising:

forming a mixture of said stannous halide, said catalyst, and an acid amide solvent, said acid amide solvent being present in an amount of about 1 to 4 mols per mol of said stannous halide; and

introducing, at substantially atmospheric pressure, a gaseous, lower alkyl halide into the mixture to bring about reaction of said stannous halide with said lower alkyl halide.

4,044,036

METAL COMPLEXES OF BIS-AZOMETHINES FROM HYDROXY-ALDEHYDES AND ALKYLENE DIAMINES

Stefan Hari, Allschwil, Switzerland; Alexander McHugh Irvine, Paisley, England; James McGeachie McCrae, Stewarton, Scotland; Laurent Vuitel, and Francois L'Eplattenier, both of Therwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

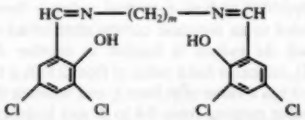
Filed Sept. 9, 1974, Ser. No. 504,597

Claims priority, application United Kingdom, Sept. 11, 1973, 42659/73

Int. Cl.[2] C07F *1/08*

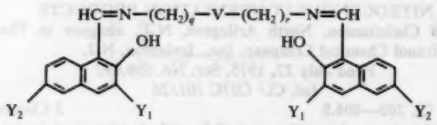
U.S. Cl. 260—438.1 **10 Claims**

1. A 1:1 nickel complex of a bis-azomethine of the formula



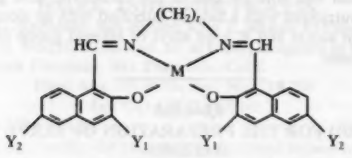
wherein *m* denotes a number from 5–7.

2. A 1:1 copper, nickel or zinc complex of a bis-azomethine of the formula



wherein V denotes an O or S atom or an imino group, Y_1 denotes a H atom, a carboxyl group, an alkoxycarbonyl group containing 2–6 C atoms, a carbamoyl group, an alkylcarbamoyl group containing 2–6 C atoms or a phenylcarbamoyl group, Y_2 denotes a H or halogen atom, an alkoxy group containing 1–4 C atoms or a nitro or cyano group and q and r denote a number from 2–4.

4. A metallized bis-azomethine of the formula



wherein M denotes a copper, nickel or zinc atom, *t* denotes a number from 3–6 and Y_1 denotes a H atom, a carboxyl group, an alkoxycarbonyl group containing 2–6 C atoms or a phenylcarbamoyl group and Y_2 denotes a H or halogen atom, an alkoxy group containing 1–4 C atoms or a nitro or cyano group.

4,044,037

SULFUR CONTAINING SILANE COUPLING AGENTS

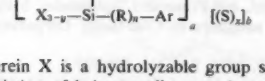
Jeffrey Y. P. Mui, Marietta, Ohio, and Arthur N. Pines, Katonah, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 24, 1974, Ser. No. 536,207

Int. Cl.[2] C07F *7/08, 7/18*

U.S. Cl. 260—448.2 N **17 Claims**

1. A polysulfide aryl silane compound having the average formula



wherein X is a hydrolyzable group selected from the class consisting of halogen, alkoxy and acyloxy radicals; R′ is an alkyl radical containing from 1 to 4 carbon atoms; *y* has a value of 0 to 2 inclusive; R is a divalent bridging group selected from the class consisting of alkylene and alkyleneoxy, radicals containing from 1 to 7 carbon atoms; *n* has a value of 0 or 1; Ar is an aryl radical containing from 6 to 12 carbon atoms; $(S)_x$ is a divalent polysulfide radical each free valence thereof being directly bonded to an aromatic carbon atom of an Ar radical whereby each Ar radical is bonded to another Ar radical through a $(S)_x$ radical, *x* has a value of from 2 to 6; *a* has a value of at least 2; *b* has a value of at least 1; and wherein the ratio of *a* to *b* is a value ranging from 0.4 to 2; and hydrolyzates and condensates thereof.

4,044,038

PROCESS FOR THE MANUFACTURE OF AT LEAST SUBSTANTIALLY BALANCED ORGANOPOLYSILOXANE MIXTURES WITH SILYL HALIDE GROUPINGS

Gerd Rossmy, Essen-Werden, Germany, assignor to Th. Goldschmidt AG, Essen, Germany

Continuation of Ser. No. 517,319, Oct. 23, 1974, abandoned. This application May 4, 1976, Ser. No. 683,085

Claims priority, application Germany, Oct. 24, 1973, 2353166

Int. Cl.[2] C07F *7/08*

U.S. Cl. 260—448.2 P **13 Claims**

1. In a process of preparing at least approximately equilibrated organopolysiloxane mixtures having silylhalide groups, by redistribution of siloxane and silylhalide groups, wherein mixtures of organohalogensilanes and organopolysiloxanes or mixtures of organopolysiloxanes with terminal silylhalide groups are equilibrated in the presence of an equilibration catalyst, the molecular weight distribution or the distribution of the individual siloxane structures of the mixtures to be treated deviating from the statistical equilibrium, the improvement which comprises that the equilibration treatment is performed in the presence of an equilibration catalyst which is a mixed catalyst comprising

a. hydrogen halide acid and

b. peralkylated acid amide,

the amount of said mixed catalyst being in the range of 0.002 to 0.2 mole per siloxane bond, said mixed catalyst being removed from the system after the equilibration treatment by phase separation.

4,044,039

HCN-OLEFIN ADDUCT USING HF

Louis DeVries, Green Brae, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 884,752, Dec. 12, 1969, abandoned. This application Nov. 13, 1972, Ser. No. 306,118

Int. Cl.[2] C07C *119/18*

U.S. Cl. 260—453 RW **8 Claims**

1. A method for preparing a primary amine in the form of a formimidate ester or thioformimidate ester, wherein the amine nitrogen is bonded to a saturated aliphatic carbon atom which comprises reacting a nonconjugated hydrocarbon olefin having a molecular weight of 28–500,000 and containing 1–50 sites of olefinic unsaturation with hydrogen fluoride and hydrocyanic acid in the presence of an alcohol mercaptan of the formula R—XH wherein X represents oxygen or sulfur and R represents a hydrocarbyl of 1–300 carbon atoms at a temperature of from about −10° to about 100° C wherein the mol ratio of hydrocyanic acid to said olefin is in the range of about 0.5–20:1, the mol ratio of said alcohol or said mercaptan to said olefin is in the range of about 0.9–10:1, and the mol ratio of hydrogen fluoride to hydrocyanic acid is in the range of about 1–10:1.

4,044,040

4,7-DIHYDROINDANYL ALKANOLS, ANALOGUES THEREOF AND THEIR CORRESPONDING TOSYLATES

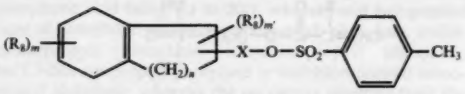
Frederic Peter Hauck, Somerville; Joyce Reid, Highland Park; Venkatachala L. Narayanan, Hightstown; Christopher M. Cimarusti, Hamilton; Rudiger D. Haugwitz, Titusville, all of N.J., and Joseph E. Sundeen, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 570,121, April 21, 1975, Pat. No. 3,984,407, which is a division of Ser. No. 372,448, June 21, 1973, Pat. No. 3,894,031, which is a continuation of Ser. No. 71,229, Sept. 10, 1970, abandoned. This application Mar. 15, 1976, Ser. No. 667,003

Int. Cl.[2] C07C *143/68, 33/02, 35/32, 35/36*

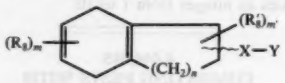
U.S. Cl. 260—456 P **4 Claims**

1. A compound of the structure



wherein X is a single bond or a straight or branched chain alkylene radical having from one to ten carbons, R_s and R'_s are lower alkyl or cycloalkyl having 3 to 6 ring members; and n is 1 to b **3**; and m and m' are 0, 1 or 2.

3. A compound of the structure



wherein X is a single bond or a straight or branched chain alkylene radical having from one to 10 carbon atoms, Y is hydroxyl, R_s and R'_s are lower alkyl or cycloalkyl having 3 to 6 ring members; and n is 1 to 3; m and m' are 0, 1 or 2; and stereoisomers thereof.

4,044,041

PREPARATION OF ESTERS OF UNSATURATED ALCOHOLS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

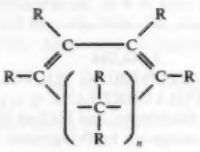
Filed Oct. 22, 1975, Ser. No. 624,694
Int. Cl.[2] C07C *67/04, 121/52, 121/54*
U.S. Cl. 260—465 D **23 Claims**

1. A process for the production of esters of monoolefinically unsaturated alcohols which comprises reacting a conjugated diolefin with an organic acid reactant under reaction conditions in the substantial absence of oxygen and employing catalytic amounts of a catalyst system consisting essentially of a copper ion, an alkali metal ion, and a halide,

wherein said conjugated diolefin is an acyclic conjugated diolefin represented by the formula

(I)

or a cyclic conjugated diolefin represented by the formula



(II)

wherein each R is individually selected from hydrogen, halogen, cyano, —COOR′, and the monovalent hydrocarbyl radicals, wherein R′ is hydrogen, or alkyl or aryl hydrocarbon radical, and n has the value of 1 to 12, and

wherein said organic acid reactant is a monocarboxylic acid R″COOH, a dicarboxylic acid R‴$(COOH)_2$, a corresponding anhydride, or both; wherein R″ is an alkyl, cycloalkyl, aryl, or combination radical, or the halogen, cyano, or —COOR′ derivative thereof, wherein the R″ radical can contain up to 4 such substituents; wherein said R‴ is a valence bond, or an alkylene, cycloalkylene, arylene, or combination radical, wherein R‴ further can contain up to 4 substituents selected from the group consisting of halogen, cyano, and —COOR′, and

employing a catalyst concentration expressed in terms of the amount of copper ion:conjugated diolefin charged in the range of about 0.01 mol percent up to an equimolar amount.

4,044,042

AMMOXIDATION PROCESS

Howard P. Angstadt, Media, Pa., assignor to Suntech, Inc., Wayne, Pa.

Filed Dec. 13, 1976, Ser. No. 750,092
Int. Cl.[2] C07C *120/14*
U.S. Cl. 260—465 C **16 Claims**

1. In the ammoxidation process of a lower alkyl substituted aromatic hydrocarbon to the corresponding nitriles, which process is carried out by reacting said hydrocarbon with ammonia and oxygen at about 375° to about 500° C., the improvement of using as catalyst an alkali metal vanadium bronze supported on α-alumina and promoted with about 2 to about 3% of tellurium, about 2 to about 3% of titanium and about 0.15% to about 0.3% of boron, said percentages being by weight of the total catalyst and its support.

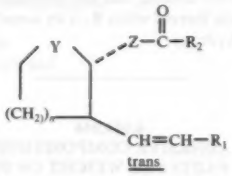
4,044,043

DERIVATIVES OF 9-OXO-13-TRANS-PROSTENOIC ACID ESTERS

Karel Francis Bernady; Middleton Brawner Floyd, Jr., both of Suffern; John Frank Poletto, Nanuet, all of N.Y.; Robert Eugene Schaub, Upper Saddle River, and Martin Joseph Weiss, Oradell, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

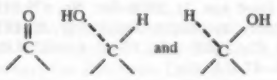
Continuation of Ser. No. 427,894, Dec. 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 162,711, July 14, 1971, abandoned. This application May 5, 1975, Ser. No. 574,794
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—468 D **34 Claims**

1. An optically active compound of the formula:

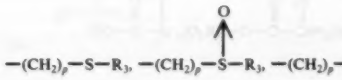


trans

wherein n is the integer 1 or 2; Y is a divalent radical selected from the group consisting of those of the formulae:



R_1 is selected from the group consisting of a straight chain alkyl group having from 3 to 10 carbon atoms, a straight chain alkyl group having from 2 to 6 carbon atoms and having one branched methyl group, a straight chain alkenyl group having from 3 to 6 carbon atoms, a straight chain ω-haloalkyl group having from 3 to 6 carbon atoms, a straight chain ω-mercaptoalkyl group having from 3 to 6 carbon atoms, a straight chain ω-carboxyalkyl group having from 3 to 6 carbon atoms, and moieties of the formulae:



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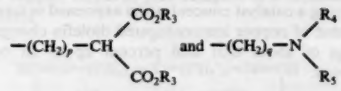
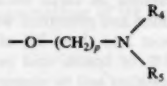
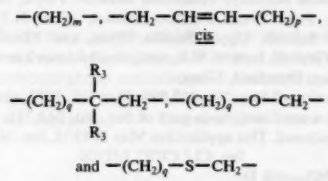


wherein p is an integer from 2 to 4, inclusive, q is an integer from 3 to 6, inclusive, R_3 is an alkyl group having from 1 to 3 carbon atoms, R_4 is selected from the group consisting of hydrogen and lower alkyl, R_5 is selected from the group consisting of hydrogen and lower alkyl, and R_4 and R_5 taken together with the N(itrogen) is selected from the group consisting of pyrrolidino, piperidino and morpholino; R_2 is selected from the group consisting of hydroxy, alkoxy having from 1 to 4 carbon atoms, pyridoxy, 2,2,2-trichloroethoxy, and a moiety of the formula:



wherein P, R_4 and R_5 are as hereinabove defined; and Z is a divalent radical selected from the group consisting of those of the formulae:



wherein m is an integer from 1 to 8, inclusive, and p, q and R_3 are as hereinabove defined; and the pharmaceutically acceptable cationic salts thereof when R_1 is an ω-carboxyalkyl group or when R_2 is hydroxy.

4,044,044

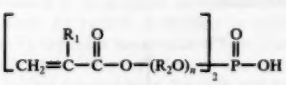
ANAEROBIC ADHESIVE COMPOSITION CONTAINING 0.05 TO 20 PARTS PER WEIGHT OF PHOSPHATE ESTERS OF HYDROXYACRYLATES PER 100 PARTS PER WEIGHT OF POLYMERIZABLE ACRYLIC ESTER MONOMER

Tsutomu Saito, 1459, Hazama-cho, Hachioji, Tokyo, Japan

Filed Apr. 21, 1976, Ser. No. 679,011
Claims priority, application Japan, Apr. 21, 1975, 50-48488
Int. Cl.[2] C08F *4/34, 30/02, 130/02, 230/02*
U.S. Cl. 260—47 UA **13 Claims**

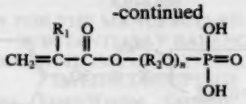
1. In an anaerobic adhesive composition comprising an anaerobically polymerizable acrylic ester monomer or mixtures thereof and an organic peroxide characterized wherein said composition contains therein phosphorus compounds having the following general formulas (A) and (B) singly or in combination, in an amount of at least 0.05 and not more than 20 parts per weight per 100 parts per weight of said monomer, thereby to enhance an adhesive force of the composition;

(A)

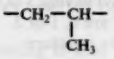


(B)

-continued



in the formulas (A) and (B), R_1 indicates H, CH_3, or C_2H_2, R_2 —CH_2—, —C_2H_4—, —C_3H_6— or



and n indicates an integer from 1 to 10.

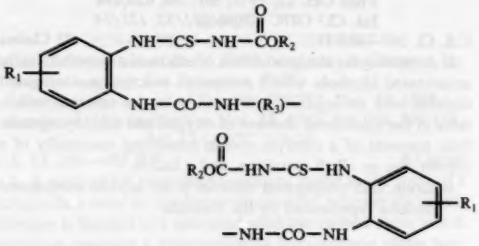
4,044,045

COMBATING PESTS WITH DI-[2-THIOUREIDO-(N-ALKOXYCARBONYL)-N-PHENYLUREIDO]-COMPOUNDS

Werner Perkow, Ahrensburg; Hans Hopp, Itzehoe, and Walter Ingwersen, Nindorf, all of Germany, assignors to Norddeutsche Affinerie, Hamburg and C. F. Spiess & Sohn, Kleinkarlbach, both of Germany

Filed May 19, 1976, Ser. No. 687,846
Claims priority, application Germany, May 24, 1975, 2523072
Int. Cl.[2] C07C *149/40*
U.S. Cl. 260—470 **3 Claims**

1. Di-[2-thioureido-(N-alkoxycarbonyl)-N-phenylureides] of the formula



wherein

R_1 is hydrogen, halogen, or an alkoxy or alkyl radical having 1 to 4 C atoms,

R_2 is an alkyl radical having 1 to 4 C atoms, and

R_3 is an alkylene radical having 3 to 10 C atoms, or a cycloalkylene or phenylene radical, or a combination of an alkylene radical with cycloalkylene or phenylene radicals, the radicals having a total of 6 to 20 carbon atoms.

4,044,046

METHOD FOR RECOVERING POLYOL FROM A POLYURETHANE

Osamu Kondo; Torao Hashimoto, and Hajime Hasegawa, all of Yokohama, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed July 31, 1975, Ser. No. 600,681
Claims priority, application Japan, Aug. 2, 1974, 49-87968
Int. Cl.[2] C07C *125/06*
U.S. Cl. 260—471 C **6 Claims**

1. A method for recovering a polyol from a polyurethane which comprises dissolving a polyurethane in an aliphatic diol having a molecular weight of about 400 to 3000 and a boiling point of higher than 180° C and decomposing the polyurethane into the polyisocyanate employed in the production of the polyurethane, the polyol employed in the production of the polyurethane and a polyamine resulting from the dissociation of the urea bond in the polyurethane by heating the dissolved polyurethane at a temperature of about 170° to 250° C in the

presence of a halogenated ester of phosphoric acid, with the weight ratio of the aliphatic diol to the halogenated ester of phosphoric acid being 1:1 to 20:1, wherein said halogenated ester of phosphoric acid is tris(chloroethyl) phosphate, tris(dichloropropyl) phosphate, tris(chloropropyl) phosphate, bis(2,3-dibromopropyl) phosphate or bis(chloropropyl) monophenyl phosphate, whereby the polyamine resulting from the dissociation of the urea bond in the polyurethane employed in the production of the polyurethane is precipitated as a solid amine derivative of phosphoric acid, and the polyol employed in the production of the polyurethane is recovered together with a polyol having a urethane bond formed by reaction of said polyisocyanate employed in the production of the polyurethane with said aliphatic diol as a liquid.

4,044,047

INTERMEDIATES FOR PREPARING SUBSTITUTED PHENYLGLYCYLCEPHALOSPORINS

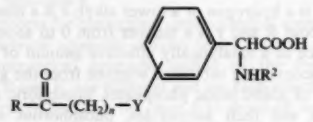
John Gerald Gleason, Cornwells Heights, Pa., assignor to Smith-Kline Corporation, Philadelphia, Pa.

Division of Ser. No. 384,771, Aug. 1, 1973, Pat. No. 3,953,439. This application Dec. 15, 1975, Ser. No. 641,064

Int. Cl.[2] C07C *125/06*

U.S. Cl. 260—471 C **9 Claims**

1. A compound of the formula:



in which:

Y is O, or NH;

n is one to five;

R is NH_2 or OR', where R' is hydrogen or lower alkyl of from one to four carbon atoms; and

R^2 is t-butoxycarbonyl.

4,044,048

RADIOPAQUE ESTERS OF TETRA-IODOTEREPHTHALIC ACID

Ernst Felder, Riva S. Vitale, Switzerland, and Davide Pitre, Milan, Italy, assignors to Bracco Industria Chimica Societa per Azioni, Milan, Italy

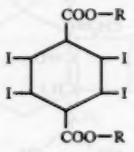
Filed May 10, 1976, Ser. No. 684,724

Claims priority, application Switzerland, June 16, 1975, 7799/75

Int. Cl.[2] C07C *69/82*

U.S. Cl. 260—475 P **11 Claims**

1. A compound of the formula



wherein **R** is 2-hydroxyethyl, 2,3-dihydroxypropyl, 1-hydroxy-2-propyl, 3-hydroxypropyl, 1,3-dihydroxy-2-propyl, 2-hydroxypropyl, 4-hydroxybutyl, or 2-(2'-hydroxyethoxy)-ethyl.

4,044,049

PHENYL BENZOIC ACID COMPOUNDS

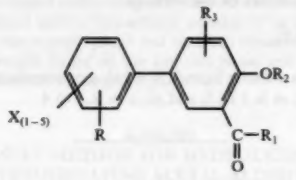
William V. Ruyle, Scotch Plains; Lewis H. Sarett, Princeton, and Alexander R. Matzuk, Colonia, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 699,017, Jan. 19, 1968, Pat. No. 3,681,445, which is a continuation-in-part of Ser. No. 577,819, Sept. 8, 1966, abandoned, which is a continuation-in-part of Ser. No. 420,823, Dec. 23, 1964, abandoned. This application Oct. 8, 1971, Ser. No. 187,833

Int. Cl.[2] C07D *69/14*

U.S. Cl. 260—479 R **5 Claims**

1. A compound of the formula:



wherein

X is halogen;

R is
- halogen,
- lower alkyl, or
- lower alkoxy;

R_1 is
- amino,
- loweralkylamino,
- diloweralkylamino,
- diloweralkylaminoloweralkylamino,
- hydrazino,
- hydroxylamino,
- N-morpholino,
- N-(4-loweralkylpiperidino),
- N-[4-hydroxyloweralkyl)-piperidino], or
- hydroxyloweralkylamino;

R_2 is
- hydrogen, or
- loweralkanoyl; and

R_3 is
- hydrogen,
- lower alkyl,
- lower alkoxy,
- benzyl,
- lower alkenyl or
- halo.

4,044,050

ISOMERIZATION OF PROPENYL ESTERS

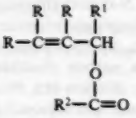
Victor P. Kurkov, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sept. 9, 1975, Ser. No. 611,763

Int. Cl.[2] C07C *67/28*

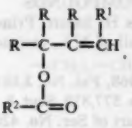
U.S. Cl. 260—491 **5 Claims**

1. A process for preparing propenyl ester isomers which comprises heating a diacyloxy propene selected from the group consisting of compounds of the formulas



and

-continued



wherein each R is independently selected from the group consisting of hydrogen and lower alkyl; R^1 is selected from the group consisting of, —O—C(O)R^2, and —CH_2—O—C(O)R^2; and R^2 is lower alkyl at a temperature of from about 25° to about 150° C in the presence of a catalytic amount of a nitrile/-palladium complex of the formula

$$(L)_mPd(X)_n$$

wherein L is a nitrile ligand; X is halogen complexed to palladium; n is 2; m is 1 to 2; and $m + n$ is 3 to 4.

4,044,051

9-[2-(1-ALKOXY-ETHYL)-5,5-DIMETHYL-CYCLOPENT-1-EN-1-YL]-3,7-DIMETHYL-NONA-2,4,6,8-TETRAEN ACID COMPOUNDS

Werner Bollag, Basel; Norbert Rigassi, Arlesheim, and Ulrich Schwieter, Reinach, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

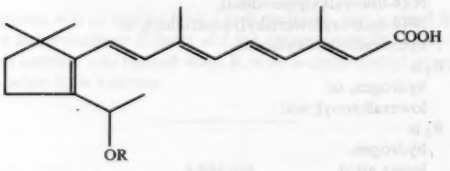
Continuation of Ser. No. 314,998, Dec. 14, 1972, abandoned. This application July 16, 1975, Ser. No. 596,499

Claims priority, application Switzerland, Dec. 22, 1971, 18721/71

Int. Cl.[2] **A61K** *31/19;* **C07C** *53/00, 61/38, 63/04*

U.S. Cl. 260—514 R **3 Claims**

1. A polyene compound of the formula:



wherein R is lower alkyl.

4,044,052

PROCESS FOR RECOVERY OF UREA FROM ITS PHENOLIC SOLUTION

Hideaki Suda, Takaishi; Iwao Dohgane, Nishinomiya, and Hirokazu Hosaka, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Continuation of Ser. No. 303,614, Nov. 3, 1972, abandoned. This application May 19, 1975, Ser. No. 578,661

Int. Cl.[2] **C07C** *102/00;* **C07B** *21/00*

U.S. Cl. 260—96.5 C **7 Claims**

1. A process for the recovery of urea from a phenolic solution thereof which comprises adding an organic solvent selected from the group consisting of N,N-dimethylformamide, N,N-dimethylacetamide, hexamethylphosphoric triamide, pyrrolidone, dimethyl ether, diethyl ether, dipropyl ether, diisopropyl ether, dioxane, tetrahydrofuran, carbon disulfide and dimethyl sulfoxide to the said phenolic solution at a temperature wherein crystals of urea are formed, and separating and collecting the resulting crystals of urea from the obtained mixture.

4,044,053

PREPARATION OF POLYALKYLENE POLYAMINES

Michael E. Brennan; Philip H. Moss, and Ernest L. Yeakey, all of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

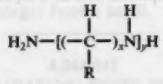
Continuation-in-part of Ser. No. 583,018, June 2, 1975, abandoned. This application May 3, 1976, Ser. No. 682,823

Int. Cl.[2] **C07C** *87/20, 85/06*

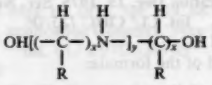
U.S. Cl. 260—583 P **8 Claims**

1. A process for preparing noncyclic polyalkylene polyamines comprising the steps of:

contacting an alkyleneamine compound having two primary amino groups of the formula:



wherein R is a hydrogen or a lower alkyl, x is a number from 2 to about 6 and y is a number from 1 to about 4 with a diol having primary or secondary hydroxy groups of the general formula:



where R is a hydrogen or a lower alkyl; x is a number from 2 to about 6; and y is a number from 0 to about 3 in the presence of a catalytically effective amount of the phosphoruscontaining substance selected from the group consisting of acidic metal phosphates, phosphoric acid compounds and their anhydrides, phosphorous acid compounds and their anhydrides, alkyl or aryl phosphate esters, alkyl or aryl phosphite esters, alkyl or aryl substituted phosphorous acids and phosphoric acids wherein said alkyl groups have from 1 to about 8 carbon atoms and said aryl groups have from 6 to about 20 carbon atoms, alkali metal monosalts of phosphoric acid and mixtures of the above at temperatures of from about 250° to about 350° C under a pressure sufficient to maintain the mixture essentially in liquid phase wherein said alkyleneamine compound is present in molar excess; and,

recovering said polyalkylene polyamine compound from the resultant reaction mixture.

4,044,054

2-OXO-3-ALKENYL DIMETHYLAMINE

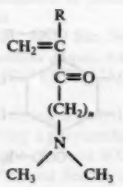
Gerry Karl Noren, Hoffman Estates, Ill., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Apr. 9, 1976, Ser. No. 675,379

Int. Cl.[2] **C07C** *97/03*

U.S. Cl. 260—584 A **2 Claims**

1. A compound of the formula



wherein:

R may be hydrogen or methyl; and

n may be 1 to 3.

4,044,055

PROCESS FOR MANUFACTURE OF TETRAKIS-(HYDROXYMETHYL)-PHOSPHONIUM SALTS

Daniel Stanley Katz, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 26, 1975, Ser. No. 635,521
Int. Cl.[2] C07F 9/54
U.S. Cl. 260—606.5 F 6 Claims

1. A process for synthesis of tetrakis-(hydroxymethyl)-phosphonium salt by reaction of phosphine reactant in a continuously flowing gas stream with a mixture of formaldehyde reactant and acid reactant in a continuously flowing liquid stream by continuously contacting said gas and liquid streams countercurrently in a multiple-stage series of at least three separate gas-liquid contacting reactor stages, each of said separate reactor stages comprising a pressure kettle having sparging means by which the part of the gas stream in said kettle is sparged through the part of the agitated liquid stream in said kettle as said respective streams are fed continuously through said series of separate stages.

4,044,056

SYMMETRICAL AROMATIC SULFIDE PRODUCTION

Richard T. Hawkins, Orem, Utah, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 20, 1976, Ser. No. 688,492
Int. Cl.[2] C07C 148/00
U.S. Cl. 260—609 E 10 Claims

1. A process for converting unsymmetrical aromatic sulfides to symmetrical aromatic sulfides which comprises subjecting an unsymmetrical aromatic sulfide of the formula RSR′ wherein R and R′ are different and are each selected from aryl and alkaryl radicals having from 6 to about 18, inclusive, carbon atoms per molecule to heating at an elevated temperature and for a period of time sufficient to disproportionate said unsymmetrical aromatic sulfide and form symmetrical aromatic sulfides of the formulas RSR and R′SR′ wherein each R and each R′ are as defined above with both R radicals being the same and both R′ radicals being the same, with the proviso that when said heating is carried out at temperatures below about 300° C there are present (1) a free radical source capable of generating a substantial concentration of free radicals at the reaction temperature employed or (2) an atmosphere of a free oxygen-containing gas.

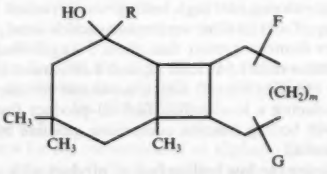
4,044,057

AROMA CHEMICALS

Jordan J. Bloomfield, and Dennis C. Owsley, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1975, Ser. No. 645,182
Int. Cl.[2] C07C 35/22
U.S. Cl. 260—617 F 4 Claims

1. A compound represented by the structural formula



wherein *m* is an integer from 1 through 8; F and G represent hydrogen or alkyl having from 1 to 3 carbon atoms; and R represents hydrogen or an alkyl having from 1 to 6 carbon atoms.

4,044,058

PROCESS FOR THE PREPARATION OF α,α,α′,α′-TETRAMETHYLPHENYLENE BISCARBINOLS

Hans-Josef Buysch, Krefeld-Bockum, and Jurgen Heuser, Krefeld, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Sept. 29, 1975, Ser. No. 617,381
Claims priority, application Germany, Oct. 4, 1974, 2447346
Int. Cl.[2] C07C 29/00, 27/10
U.S. Cl. 260—618 C 6 Claims

1. In the process for the preparation of an α,α,α′,α′-tetramethyl-phenylene-biscarbinol by the oxidation of at least one diisopropyl benzene with air or oxygen at elevated temperatures in the presence of an aqueous solution of a strong alkali, the improvement comprising carrying out the oxidation with a monocarbinol and/or biscarbinol content of at least 52% by weight in the organic phase and an alkali concentration of 9 to 30% by weight based on the aqueous phase and 1 to 10% by weight based on the organic phase.

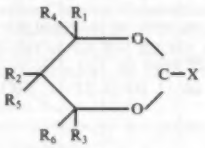
4,044,059

ONE-STEP METHOD FOR HYDROLYZING AND HYDROGENATING ACETAL-ALDEHYDES

Harry Bugbird Copelin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 494,292, Aug. 2, 1974, abandoned. This application May 4, 1976, Ser. No. 682,979
Claims priority, application Germany, May 30, 1975, 2523840
Int. Cl.[2] C07C 27/14, 31/18
U.S. Cl. 260—635 A 8 Claims

1. A one-step process for the hydrolysis and hydrogenation of a cyclic acetal-aldehyde of the general formula



wherein
X is

which M is alkyl of 1 to 20 carbon atoms and R_1, R_2, R_3, R_4, $R_5$and R_6 are the same or different hydrogen or alkyl of 1 to 20 carbon atoms which comprises contacting the cyclic acetal-aldehyde with the combination of hydrogen, water at a molar ratio of water to acetal-aldehyde of 1:1 to 100:1, separate solid particles of a strongly acid water insoluble ion-exchange resin and a catalytic amount of a nickel hydrogenation catalyst, said ion-exchange resin to nickel catalyst weight ratio being 0.1:1 to 100:1 at a temperature of from 65° to 150° C and a hydrogen pressure of from 500 to 10,000 psig to form the corresponding polyol.

4,044,060

PROCESS FOR PREPARING GEMINAL DIHALIDES

Hans-Josef Buysch, and Karl-Heinz Scholz, both of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 12, 1976, Ser. No. 685,558
Claims priority, application Germany, June 7, 1975, 2525442
Int. Cl.[2] C07C 25/00, 23/00
U.S. Cl. 260—651 R 8 Claims

1. Process for preparing geminal dichloride from a non-enolisable compound selected from the group consisting of aldehydes and ketones which comprises reacting said compound

selected from the group consisting of aldehydes and ketones with phosgene or thionyl chloride in the presence of an organyl-phosphorus compound selected from the group consisting of di-organyl-halogenophosphine, tri-organyl-phosphine, tri-organyl-phosphonium salt, tri-organyl-phosphorus betaine, tri-organyl-phosphine alkylene, 1,1-dihalogeno-tri-organyl-phosphine, 1-halogeno-1-acyl-tri-organyl-phosphine, 1-halogeno-1-hydroxy-tri-organyl-phosphine, tri-organyl-phosphine oxide and tri-organyl-phosphine sulfide.

4,044,061

PREHEATING METHANOL EFFECTS STEADY STATE OPERATION OF CONVERSION TO GASOLINE

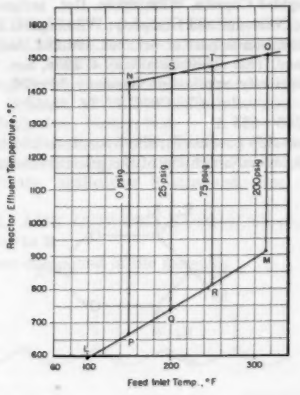
Clarence D. Chang, Princeton, N.J.; Anthony J. Silvestri, Morrisville, Pa., and John C. Zahner, Princeton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 508,390, Sept. 23, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,633

Int. Cl.[2] C07C *1/22*

U.S. Cl. 260—668 R **10 Claims**

FIGURE II



1. In a process for the catalytic conversion of methanol to form a gaoline boiling range hydrocarbons under exothermic reaction conditions within the range of 689 to 747 BTU/LB in the presence of a crystalline zeolite conversion catalyst, the improvement which comprises,

limiting the adiabatic reactor effluent temperature of the exothermic conversion of methanol to gasoline below about 900° F by preheating the methanol feed only sufficient to take advantage of the exothermic reaction heat for providing latent heat of vaporization of the preheated feed plus the sensible heat required to take the preheated feed up to reaction temperature.

4,044,062

HYDROCARBON SEPARATION

Donald J. Korous, Maywood, and Richard W. Neuzil, Downers Grove, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Apr. 21, 1971, Ser. No. 136,199

Int. Cl.[2] C07C *7/13*

U.S. Cl. 260—674 SA **5 Claims**

1. A process for separating bi-alkyl substituted monocyclic aromatic isomers having more than eight and less than about eighteen carbon atoms per molecule from a feed mixture containing at least two of said isomers including the para-isomer which comprises contacting said feed with a crystalline aluminosilicate selected from the group consisting of type X structured and type Y structured zeolites containing at cationic exchangeable sites both barium and potassium cations, or potassium and beryllium cations, or potassium and magnesium cations, or rubidium and barium cations, or cesium and barium cations, or potassium and rubidium cations or potassium and cesium cations, said contacting being at adsorption conditions to selectively adsorb said para-isomer from said feed.

5. A process for separating cymene isomers from a feed mixture consisting essentially of p-cymene and m-cymene, which comprises contacting said mixture with a type X structured zeolite containing at cationic exchangeable sites both barium and potassium cations, said contacting being at adsorption conditions to selectively adsorb said p-cymene from said mixture.

4,044,063

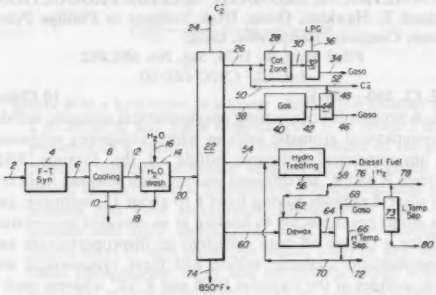
METHOD FOR ALTERING THE PRODUCT DISTRIBUTION OF WATER WASHED, FISCHER-TROPSCH SYNTHESIS HYDROCARBON PRODUCT TO IMPROVE GASOLINE OCTANE AND DIESEL FUEL YIELD

Henry R. Ireland, Woodbury, and Thomas R. Stein, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 18, 1975, Ser. No. 614,589

Int. Cl.[2] C07C *1/04*

U.S. Cl. 260—676 R **7 Claims**



1. A method for upgrading products of Fischer-Tropsch Synthesis comprising hydrocarbon and oxygenates which comprises,

cooling the product of Fischer-Tropsch Synthesis sufficient to recover a water phase separately from a liquid hydrocarbon phase and a gaseous phase comprising hydrocarbons,

water washing said liquid hydrocarbon and said gaseous phase to recover oxygenates therefrom,

separating the liquid hydrocarbon phase and said gaseous phase under conditions to recover C_2 and lower boiling gaseous material, a C_3—C_4 rich hydrocarbon fraction, a gasoline boiling fraction comprising C_5 and higher boiling material, a light oil fraction extending in boiling range from the separated gasoline fraction up to about 600° F, and a high boiling waxy hydrocarbon fraction boiling above about 600° F,

hydrodewaxing said high boiling waxy fraction in the presence of a crystalline zeolite conversion catalyst having a pore diameter greater than about 5 Angstroms; a silica-to-alumina ratio of at least 12; and a constraint index within the range of 1 to 12 which is suitable for the purpose of producing a low boiling fuel oil product fraction and a lower boiling fraction comprising gasoline boiling range material,

combining the low boiling fuel oil product with said light oil fraction and subjecting the combined materials to hydrogenating conditions sufficiently severe to produce a stabilized fuel oil product,

passing the separated C_5 plus gasoline fraction in contact with a crystalline zeolite having a pore diameter greater

than about 5 Angstroms; a silica to alumina ratio of at least 12; and a constraint index within the range of 1 to 12 under conditions selected to produce a gasoline product of considerably improved octane rating and lower boiling gaseous materials which are thereafter separated from one another;

combining gaseous materials above separated from the octane improved gasoline product with the C_3—C_4 rich hydrocarbon fraction and thereafter contacting the gaseous materials thus combined with a catalyst promoting the formation of additional gasoline boiling component and liquified petroleum gas.

4,044,064

CONVERSION OF FISCHER-TROPSCH HEAVY PRODUCT TO HIGH QUALITY JET FUEL

Donald Milstein, and Thomas R. Stein, both of Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,511
Int. Cl.² C07C *1/04*
U.S. Cl. 260—676 R **9 Claims**

1. A process of producing high quality gasoline and higher boiling products which comprises hydrotreating a wide boiling range aliphatic hydrocarbon fraction comprising oxygenates boiling in the range of about 350° to 850° F;

separating the hydrotreated product to produce a 650° F plus fraction and a 650° F minus fraction,

separating said 650° F minus fraction to produce a gasoline boiling fraction and higher boiling light oil fraction,

separating said high boiling light oil fraction to produce a kerosine boiling fraction and a higher boiling distillate fraction having a low pour point;

separately converting said kerosine boiling fraction and said 650° F plus fraction with a catalyst comprising a special zeolite component having a silica to alumina ratio of at least 12 and a constraint index of 1 to 12, at a temperature in the range of about 500° to 800° F, and at a space velocity of about 0.5 to 5 WHSV, to produce a conversion product of said zeolite catalyst,

separating product obtained by converting said 650° F plus distillate fraction with said special zeolite catalyst to produce a C_4 minus gaseous product, a naphtha boiling range product, and a higher boiling distillate product suitable for producing jet fuel boiling range material and diesel fuel; and

separating product obtained by converting said kerosine boiling fraction with said special zeolite catalyst to produce a C_4 minus gaseous product, a naphtha boiling range product and a kerosine boiling range product suitable for use as jet fuel.

4,044,065

CONVERSION UTILIZING A PHOSPHORUS-CONTAINING ZEOLITE CATALYST

Stephen A. Butter, East Windsor, and Warren W. Kaeding, Westfield, both of N.J., assignors to Mobile Oil Corporation, New York, N.Y.

Division of Ser. No. 508,308, Sept. 23, 1974, Pat. No. 3,972,832. This application Dec. 8, 1975, Ser. No. 638,862
Int. Cl.² C07C *3/62*
U.S. Cl. 260—677 R **19 Claims**

1. A process for the conversion of an aliphatic hydrocarbon comprising contacting the same with a catalyst comprising a crystalline aluminosilicate zeolite containing hydrogen ions, having a silica to alumina ratio of at least about 12 and a constraint index of about 1 to 12, said zeolite having been contacted with a phosphorus compound to combine therewith at least about 0.78 percent by weight of phosphorus.

4,044,066

NICKEL-PHOSPHORUS OXIDATIVE DEHYDROGENATION CATALYST

Dennis L. Ripley, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 140,963, May 6, 1971, Pat. No. 3,943,068. This application Oct. 8, 1975, Ser. No. 620,729
Int. Cl.² C07C *11/12*
U.S. Cl. 260—680 E **8 Claims**

1. A process for the dehydrogenation of a hydrocarbon feedstock having 2 to 12 carbon atoms and at least one

grouping which comprises contacting said feedstock in the vapor phase under dehydrogenation conditions in the presence of molecular oxygen with a catalyst consisting essentially of nickel, phosphorus, an alkali metal and oxygen, wherein the amount of nickel is in the range of 48 to 75 weight percent, the amount of phosphorus is in the range of 0.1 to 16.8 weight percent, the amount of alkali metal is in the range of about 0.1 to 10 weight percent and the amount of oxygen is sufficient to satisfy the valence requirements of all elements therein present; and wherein the amount of phosphorus is less than that required for stoichiometric nickel phosphate.

4,044,067

PURIFICATION OF UNSATURATED COMPOUNDS

Alfio J. Besozzi, and Alan W. Foster, both of Houston, Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 420,046, Nov. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 223,363, Feb. 3, 1972, abandoned. This application Oct. 30, 1975, Ser. No. 627,117
Int. Cl.² C07C *11/12, 15/00, 11/00, 7/00*
U.S. Cl. 260—680 E **1 Claim**

1. In a vapor phase process for the preparation of unsaturated hydrocarbons comprising

catalytic oxidative dehydrogenation of a feed stream of hydrocarbon compounds having 4 to 8 carbon atoms to produce an unsaturated hydrocarbon product stream having a greater degree of ethylenic unsaturation than said feed stream and containing organic carbonyl compounds as an impurity

wherein the improvement comprises contacting said product stream in vapor phase at a temperature in the range of 250° to 800° C and containing less than 5 mol percent free oxygen with a solid catalyst for destroying said carbonyl compounds consisting of mixtures of oxides of Mn, Zn and Cr, and removing organic carbonyl compounds.

4,044,068

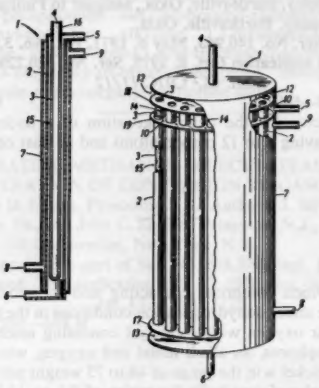
PROCESS FOR AUTOTHERMIC CRACKING OF ETHANE TO ETHYLENE

Bruce E. Kurtz, Marcellus, N.Y., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Oct. 14, 1975, Ser. No. 622,347
Int. Cl.² C07C *5/42, 5/44, 5/48*
U.S. Cl. 260—683.3 **11 Claims**

1. A process for producing ethylene by the oxidative dehydrogenation of ethane which comprises (a) passing a gas containing ethane under pressure into a first elongated gas passage, (b) passing a gas mixture containing chlorine and oxygen under pressure into a second elongated gas passage positioned along said first gas passage, said first and second elongated gas passages being separated by a porous member, (c) maintaining the pressure of the gases in said second gas passage in excess of the pressure in said first gas passage for diffusion of oxygen and chlorine into said first gas passage, (d) maintaining said first gas passage under conditions sufficient to effect the reaction

therein of at least a portion of said diffused oxygen and chlorine with ethane for production of ethylene, and (e) withdrawing the gas product containing ethylene from said first gas passage.



4,044,069

CATALYTIC COMPOSITION FOR THE ISOMERIZATION AND ALKYLATION OF HYDROCARBONS

Jean René Bernard, St-Symphorien d' Ozon; Daniel Elie Brunel, Montpellier; Auguste André Coimmeyras, Clapiers; Camille Michel Coste, Amelie-Les-Bains; Jean Joseph Itier, Montpellier, and Hubert Wilhelm Knoche, Meyzieu, all of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

Division of Ser. No. 509,608, Sept. 26, 1974, Pat. No. 3,960,764. This application Feb. 10, 1976, Ser. No. 656,902
Claims priority, application France, Sept. 26, 1973, 73.34561
Int. Cl.[2] C07C *3/54, 5/24*
U.S. Cl. 260—683.47 **15 Claims**

1. A method for the isomerization of paraffins in which the paraffins are brought into contact under conditions suited to the isomerization with a catalytic composition which comprises a mixture of (1) a Lewis acid corresponding to the formula MX*m* in which:

M is an atom of a metal belonging to Groups IV, V and VI of the Periodic Table of Elements,

X is a halogen,

m is within the range of 3 to 6,

and (2) an acid corresponding to the formula $C_NF_{(2n+1)}SO_3H$ in which *n* is within the range of 2 to 8, and

recovering isomerized paraffins from said contact.

14. A method for the alkylation of isoparaffins with olefins in which the isoparaffins and olefins are brought into contact under conditions suited to the alkylation with a catalytic composition which comprises a mixture of (1) a Lewis acid corresponding to the formula MX*m* in which:

M is an atom of a metal belonging to Groups IV, V and VI of the Periodic Table of Elements,

X ix a halogen,

m is within the range of 3 to 6,

and (2) an acid corresponding to the formula $C_NF_{(2n+1)}SO_3H$ in which *n* is within the range of 2 to 8, and

recovering alkylate product from said contact.

4,044,070

POWDER PAINT BLENDS OF AN EPOXY AND HYDROXY-FUNCTIONAL COPOLYMER AND A CARBOXY-TERMINATED COPOLYMER

Santokh S. Labana, Dearborn Heights, and Ares N. Theodore, Farmington, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 426,164, Dec. 19, 1973, Pat. No. 3,959,405. This application Feb. 18, 1976, Ser. No. 659,178
Int. Cl.[2] C08L *63/10*
U.S. Cl. 260—836 **2 Claims**

1. In a thermosettable powder paint which exclusive of pigments, catalysts, antistatic agents, and plasticizers, the same being conventional non-reactive additives to a thermosettable powder paint, consists essentially of a coreactable particulate mixture of

A. an epoxy-functional copolymer of monoethylenically unsaturated monomers consisting essentially of about 5 to about 20 weight percent of a glycidyl ester of a monoethylenically unsaturated carboxylic acid and about 80 to about 95 weight percent of other monoethylenically unsaturated monomers, and having a glass transition temperature in the range of about 40° to about 90° C. and a molecular weight in the range of about 1500 to about 15,000,

B. as crosslinking agent, a carboxy-functional polymer,

C. 0.05 to about 4 weight percent of a non-reactive polymeric flow control agent based on the weight of said coreactable particulate mixture,

the improvement wherein:

1. said epoxy-functional copolymer is qualitatively difunctional and said other monoethylenically unsaturated monomers consist essentially of difunctional monomers selected from the group consisting of hydroxyethyl acrylates and methacrylates, hydroxypropyl acrylates and methyacrylates, and hydroxybutyl acrylates and methacrylates in an amount comprising about 2 to about 10 weight percent of said copolymer and monoethylenically unsaturated monomers consisting essentially of monofunctional monomers selected from the group consisting of esters of a C_1—C_8 monohydric alcohol and acrylic acid, esters of C_1—C_8 monohydric alcohol and methacrylic acid and C_8—C_{12} monovinyl hydrocarbons, and
2. said carboxy-functional polymer has molecular weight in the range of about 1500 to about 15,000 and is a copolymer of about 5 to about 20, weight percent of an alpha-beta olefinically unsaturated monocarboxylic acid selected from acrylic and methacrylic acid and about 80 to about 95 weight percent of alpha-beta, monoethylenically unsaturated monomers consisting essentially of monofunctional monomers selected from the group consisting of esters of a C_1 - C_8 monohydric alcohol and a monocarboxylic acid selected from acrylic acid and methacrylic acid, and C_8 - C_{12} monovinyl hydrocarbons, said esters of a C_1 - C_8 monohydric alcohol and a monocarboxylic acid selected from acrylic acid and methacrylic acid comprising in excess of 50 weight percent of said carboxy-functional polymer, and is present in said coreactive particulate mixture in an amount that provides about 0.4 to about 1.4 carboxyl groups per functional group on said epoxy-functional copolymer.

4,044,071

SINGLE STEP PREPARATION OF BLOCK COPOLYMER OF POLYAMIDES

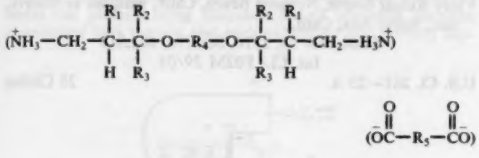
Stephen L. Nickol, Wilmington, Del., assignor to Suntech, Inc., Wayne, Pa.

Filed Nov. 8, 1976, Ser. No. 740,160
Int. Cl.[2] C08L *77/00*
U.S. Cl. 260—857 TW **6 Claims**

1. A process for forming a block polyamide copolymer comprising:

a. mixing in an inert atmosphere a molten melt spinnable

polyamide and a dry salt selected from the group consisting of prepolyamides represented by the formula:



wherein

R_1, R_2 and R_3 are selected from the group consisting of H, C_1–C_{10} alkyls and C_3–C_{10} isoalkyls; and

R_4 is selected from the group consisting of C_1–C_{10} alkylenes and C_3–C_{10} isoalkylenes; and

R_5 is selected from the group consisting of C_6–C_{14} arylenes, C_0–C_{10} alkylenes and C_3–C_{10} isoalkylenes; and the salt content amounts to between from about 10 weight % to about 75 weight % of the total weight;

b. heating and mixing in the inert atmospheres resulting mixture of the salt and the polyamide to a temperature in the range of between from the melting point of higher melting component to below about amide-interchange temperature to a blend of the melt-spinnable polyamide and polyamide which would result from the polymerization of the salt; and

c. continuing mixing at the aforementioned temperature and in the inert atmosphere until substantially all of the salt and the polyamide are converted to the block polyamide copolymer.

4,044,072

FLAME RETARDANT COMPOSITIONS AND METHODS FOR THEIR PREPARATION

Irving Touval, Edison, N.J., assignor to M&T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 325,036, Jan. 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 179,167, Sept. 9, 1971, abandoned, which is a continuation-in-part of Ser. No. 68,538, Aug. 31, 1970, abandoned. This application Mar. 5, 1976, Ser. No. 664,193

Int. Cl.[2] C08K *5/03, 3/38, 3/22*

U.S. Cl. 260—859 PV **6 Claims**

3. A polymer composition possessing enchanced flame retardng characteristics comprising a normally flammable non-halogen-containing polymer selected from the group consisting of polyolefins, polyesters, vinyl polymers, polyurethanes and acrylic polymers in combination with a) between 10 and 50%, based on the weight of said polymer composition, of a halogen source selected from the group consisting of chlorine-containing hydrocarbons, bromine-containing hydrocarbons, poly(vinyl chloride), poly(vinylidene chloride) and copolymers wherein at least 50% of the repeating units are derived from one or both of vinyl chloride and vinylidene chloride, and b) from 0.5 to 25 parts by weight per 100 parts of said polymer, of a mixture of hydrated stannic oxide and hydrated zinc borate wherein the zinc borate constitutes from 50 to 65%, based on the total weight of said mixture.

4,044,073

HIGH IMPACT STRENGTH BLENDS OF POLYBUTYLENE TEREPHTHALATE

Arthur L. Baron, and Herbert L. Rawlings, both of New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed May 23, 1975, Ser. No. 580,400

Int. Cl.[2] C08L *67/02*

U.S. Cl. 260—860 **19 Claims**

1. A thermoplastic resin having a drop dart impact resistance of at least about 60 foot-pounds and comprising an intimate mechanical blend of:

a. 60 to 90 wt.% of polybutylene terephthalate with an intrinsic viscosity of at least about 0.95,

b. 10 to 20 wt.% of an aromatic polycarbonate having a melt index of 0.1 to 25 gm/10 min. at 572° F (ASTM - D-1238); and

c. 0 to 20 wt.% of a flame retardant package comprising

i. an aromatic bromine compound present in sufficient amount to provide about 3.5 to 10 wt.% bromine based on the total weight of the resin, and

ii. an antimony containing compound present in sufficient amounts to provide about 3 to 8 wt.% of antimony based on the total weight of resin,

at least one of said polybutylene terephthalate and said polycarbonate being in the form of a powder at the time the blend is produced.

4,044,074

FLAME RETARDANT POLYCARBOXY ALKYL AND ARYL PHOSPHONATES

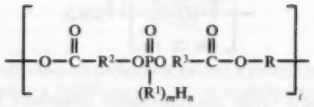
Edward N. Walsh, New City, and Milton L. Honig, Bronx, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 22, 1976, Ser. No. 669,004

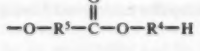
Int. Cl.[2] C07F *9/40*

U.S. Cl. 260—928 **4 Claims**

1. A compound having the formula:



wherein R is selected from the group consisting of C_2–C_{10} alkylene, arylene, C_7–C_{20} alkylene substituted arylene, C_3–C_{20} cycloalkylene, C_4–C_{20} vinylene and derivatives of the foregoing containing non-labile pendant halogens, C_1–C_6 alkyl groups, C_1–C_6 haloalkyl groups, vinyl groups, ether groups and C_1–C_6 alkyl alcohol groups; R^1 is selected from the group consisting of C_1–C_{10} alkyl, aryl, C_7–C_{20} alkyl substituted aryl, C_2–C_{10} alkenyl, phenoxy, C_1–C_{10} alkoxy, aryloxy, and C_3–C_{20} cycloalkyl, and derivatives thereof containing non-labile pendant halogens, C_1–C_6 alkyl groups, C_1–C_6 haloalkyl groups, vinyl groups, ether groups, and C_1–C_6 alkyl alcohol groups and



and OR^4H wherein R^4 has the same definitions as R, and R^4 and R can be the same or different; R^2, R^3 and R^5 are straight or branched C_1–C_{10} alkylene and can be the same or different; i is an integer from about 2 to about 20; the integers represented by m and n are different and are 0 to 1.

4,044,075

DIALKYLPHOSPHONOPROPIONIC ACID AMIDES AND PROCESS FOR THEIR MANUFACTURE

Horst Jäger, Bettingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

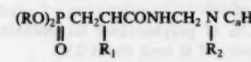
Filed Dec. 10, 1975, Ser. No. 639,320

Claims priority, application Switzerland, Dec. 20, 1974, 17036/74

Int. Cl.[2] C07F *9/40*

U.S. Cl. 260—943 **9 Claims**

1. Dialkylphosphonopropionic acid amides of formula



wherein R is straight-chain or branched alkyl of 1 to 8 carbon atoms, R_1 is hydrogen or methyl, R_2 is hydrogen or C_nH_{2n+1} and n is an integer from 1 to 24.

4,044,076

METHOD FOR PRODUCING PHOSPHORUS-CONTAINING POLYMERS

Yoshiya Kametani; Tetsuro Nakahama, both of Yokohama; Atsushi Kawai, Hiroshima, and Koji Mimura, Otake, all of Japan, assignors to Nitto Chemical Industry Co., Ltd. and Mitsubishi Rayon Co., Ltd., both of Tokyo, Japan

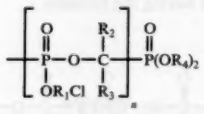
Filed Feb. 27, 1976, Ser. No. 661,861

Claims priority, application Japan, Apr. 18, 1975, 50-46549; Apr. 18, 1975, 50-47925

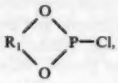
Int. Cl.[2] C07F *9/40*

U.S. Cl. 260—969 **8 Claims**

1. In a method for producing a phosphorus-containing polymer having the formula:



by reacting a cyclic chlorophosphite compound having the formula



a ketone compound having the formula

and a triorganophosphite compound having the formula

$$P(OR_4)_3$$

wherein R_1 is ethylene or propylene, R_2 and R_3 are methyl or ethyl and may be the same or different, R_4 is an alkyl group having 1 to 4 carbon atoms or an aralkyl group in which the alkyl substituent has 1 to 4 carbon atoms and the hydrogen atoms in these groups may be substituted with chlorine or bromine, and n is an integer of from 1 to 1000, the improvement which comprises:

reacting said compounds in the presence of an active halide represented by the formula

$$R_5—X$$

wherein R_5 is an unsaturated or saturated aliphatic, alicyclic or aromatic group having 1 to 10 carbon atoms or a combination thereof, and R_5 may contain a carbonyl group or a sulfonyl group and X is halogen at a temperature of from −50° C to 200° C.

4,044,077

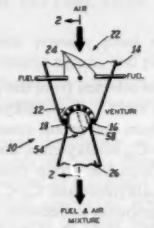
VARIABLE VENTURI NOZZLE-MATRIX CARBURETOR ADD METHODS FOR INTERMIXING FUEL AND AIR

Viney Kumar Gupta, Newport Beach, Calif., assignor to Matrix, Inc., Santa Ana, Calif.

Filed Feb. 25, 1976, Ser. No. 661,318

Int. Cl.[2] F02M *29/04*

U.S. Cl. 261—23 A **25 Claims**



1. Apparatus for substantially homogeneously intermixing flows of fuel and air to be supplied to an engine or the like, which comprises:

a. a chamber adapted for receiving mainstream flows of fuel and air and for discharging a substantially homogeneous mixture of said flows,

b. a matrix including a number of nozzle cells arranged in generally parallel flow, as opposed to series flow, relationship,

said nozzle-matrix being disposed within the chamber in a position adapted for receiving at least a portion of the mainstream flows of fuel and air and for causing said received flow portion to be divided into separate subflows through said nozzle cells,

said nozzle cells being arranged, oriented, and structured to focus said subflows therefrom towards a common downstream cross flow mixing zone defined by the nozzle-matrix center of curvature and adapted for substantially homogeneously intermixing fuel and air from said mainstream flows, at least most of said nozzle cells having cross sections which converge towards said common mixing zone and having nozzle cell lengths at least comparable to cross sectional dimensions thereof.

4,044,078

AIR HANDLER

Richard E. Curtis, Pleasanton; Robert H. Dench, Monte Sereno, and Victor J. Dervin, Cupertino, all of Calif., assignors to N.P.I. Corporation, Burlingame, Calif.

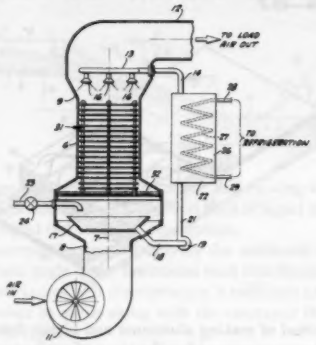
Filed Feb. 9, 1976, Ser. No. 656,121

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—30 **1 Claim**

1. An air handler especially for use with a produce storage room comprising a housing having an upright tubular portion, a transversely enlarged lower portion immediately below said tubular portion, a reduced vertical inlet portion opening into the bottom of said enlarged lower portion, an enlarged vertical outlet portion opening from the top of said tubular portion, means for supplying air above atmospheric pressure to said inlet portion, means for conducting air from said outlet portion to said storage room, a water cooler, a water collector positioned substantially centrally in said enlarged lower portion spaced above and extending entirely across said inlet portion and spaced below and extending entirely across said tubular portion, said collector being of less transverse dimension than said enlarged portion to provide an air flow path therearound from said inlet portion to said tubular portion, a water distributor in said outlet portion, means for withdrawing water from said collector and propelling said water through said water cooler to said distributor to fall from said distributor through said tubular portion back to said collector, a transverse grid

base extending across said enlarged lower portion above said collector, and a water and air baffle unit in said tubular portion in the path of water falling from said distributor to said collector, said unit including a plurality of superposed expanded metal flat plates having diamond-shaped openings between connecting bars therein and each extending horizontally substantially across said housing, said unit also including vertical rods at their lower ends resting loosely on said transverse grid base for transverse movement and supporting individual ones of said plates at vertical intervals from adjacent ones of said plates to provide intervening spaces between said plates for air and water flow.

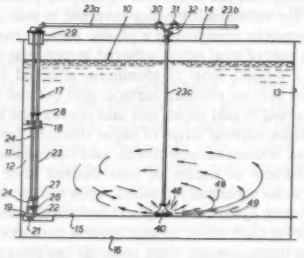


4,044,079

DROP LINE DEVICES

Oyvind Tveit, Skjoldtun, Norway, assignor to Patents and Developments A/S, Helldal, Norway

Filed Nov. 20, 1975, Ser. No. 633,782
Claims priority, application Norway, Nov. 20, 1974, 744164
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—36 R **6 Claims**



1. In combination with a storage tank for fluid cargo, a drop line device for circulating the fluid cargo within said tank, said drop line device comprising

a pump having an inlet opening into said tank to receive a flow of fluid cargo;

a conduit connected to said pump and disposed within said tank to receive a pressurized flow of the fluid cargo from said pump; and

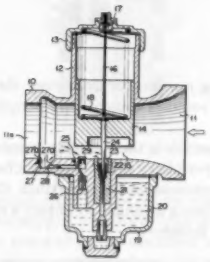
a discharge head connected to said conduit and disposed above a bottom of said tank to discharge the pressurized flow of fluid cargo in a plurality of currents into said tank outwardly of said discharge head to produce strong and concentrated currents of the fluid cargo along the bottom of said tank, said discharge head including a skirt portion having a convexly curved inner surface, an inset member having a concavely curved inner surface opposite said surface of said skirt portion, and a plurality of separating walls extending between said surfaces to define branch passages between each first pair of walls communicating with said conduit and a hollow space between each second pair of walls, wherein the sum of the cross-section of said branch passages is less than the internal flow cross-section of said conduit to provide an increase in flow velocity of the flow at the outlets of said passages.

4,044,080

CARBURETOR

Hiromitsu Matsumoto, and Kazuo Uchiyama, both of Hamamatsu, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Continuation of Ser. No. 536,407, Dec. 26, 1974, abandoned.
This application June 17, 1976, Ser. No. 696,931
Claims priority, application Japan, Dec. 28, 1973, 49-120
Int. Cl.[2] F02M *29/00*
U.S. Cl. 261—44 R **11 Claims**



1. In combination: a carburetor having a piston type throttle valve defining a carburetor throat of variable cross-section, said cross-section being reduced so that flow of fluid therethrough generates a reduced pressure therein; an upstream air passage for exposure to atmospheric pressure; a downstream mixture supply passage for connection with an intake port of an internal combustion engine, said carburetor throat interconnecting and being placed immediately between said passages; supply means for delivering fuel to said carburetor throat, catching means downstream from said throat for catching liquefied fuel which has deposited on the inner wall of the mixture supply passage and then flowed downstream; and return passage means for conducting the recovered liquefied fuel from the catching means to the carburetor throat by virtue of a difference in pressure between the pressure in the mixture supply passage at the catching means and the pressure in the carburetor throat, said return passage means having a first opening opening directly into the carburetor throat to return said liquefied fuel thereto, the rate of flow of said liquefied fuel being determined by its availability and by the difference between said pressures.

4,044,081

DEVICE IN CARBURETTORS, PARTICULARLY FOR INTERNAL COMBUSTION ENGINES

Franz Weidlich, Snapphanevagen 150, 175 34 Jarfalla, Sweden

Filed Feb. 3, 1976, Ser. No. 654,883
Claims priority, application Sweden, Feb. 6, 1975, 7501340
Int. Cl.[2] F02M *17/16*
U.S. Cl. 261—51 **8 Claims**

1. A carburetor device for an internal combustion engine having a combustion air inlet duct, which comprises

a. a rotatable member mounted for rotation in the inlet duct about the axis thereof, the rotatable member defining

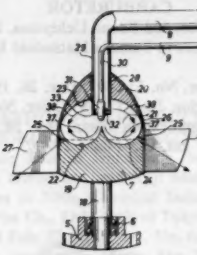
1. a substantially heart-shaped interior chamber,

b. means for supplying fuel under pressure to the interior chamber, the fuel supplying means including

1. an axially extending jet portion mounted centrally in the interior chamber for ejecting the fuel thereinto,

c. means for supplying a gaseous medium under pressure to the interior chamber whereby the gaseous medium is mixed with the fuel therein,

1. curved surfaces in the interior of the rotatable member defining the heart-shaped interior chamber and merging in axial alignment with the jet portion into a fuel flow



dividing portion for deflecting the fuel flow from the axis of rotation towards the periphery of the chamber, and

d. outlet channels in the rotatable member in communication with the periphery of the interior chamber for exhausting the fuel-gaseous-medium mixture therefrom, the outlet channels being arranged to impart a rotational force to the rotatable member.

4,044,082

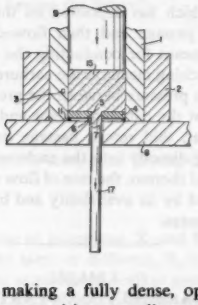
MULTIPLE EXTRUSION OF POLYCRYSTALLINE EXTRUDATES

King Harry Rosette, Chagrin Falls, Ohio, assignor to The Harshaw Chemical Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 179,787, Sept. 13, 1971, abandoned. This application Dec. 17, 1973, Ser. No. 425,090

Int. Cl.[2] B29D *11/00*

U.S. Cl. 264—1 **2 Claims**



1. A process of making a fully dense, optically integral, polycrystalline body comprising extruding an optically single crystal ingot at a temperature below its melting point but above about one-half its melting point measured in degrees Centigrade, and under sufficient pressure to produce a first extrudate, and re-extruding said first extrudate at a temperature below its melting point but above about one-half its melting point measured in degrees Centigrade, and under sufficient pressure to produce a re-extrudate, said re-extrudate having a structure different from said first extrudate in that said re-extrudate exhibits a characteristic first scatter pattern of a visible laser beam which first pattern is distinguishable from a second scatter pattern of said beam through said first extrudate.

4,044,083

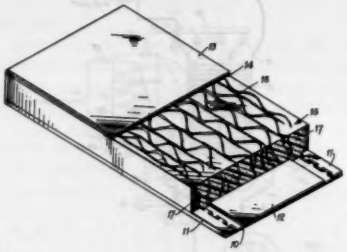
METHOD OF MAKING PLASTIC SKI

John G. Howe, and William L. Schmidt, both of Boulder, Colo., assignors to AMF Incorporated, White Plains, N.Y.

Division of Ser. No. 410,825, Oct. 29, 1973, Pat. No. 3,930,658. This application July 23, 1975, Ser. No. 598,196

Int. Cl.[2] B29D *27/04*

U.S. Cl. 264—45.3 **3 Claims**



1. A method of making aluminum and plastic foamed sandwich ski structure comprising the steps of preforming top and bottom ski subassemblies, laying said top subassembly in the bottom of a mold, spreading depositing and a foamable thermosetting resin material in liquid form over said top subassembly, inserting a slightly oversized corrugated paper laminate member having strips of compressible highly porous foam material on opposite sides thereof into said foamable thermosetting resin over said laminated member and strip members closing said mold to partially crush said laminate member and compress said strip members whereby the same bears against said top and bottom subassemblies to retain them seated in said mold to the desired thickness of a core between said top and bottom subassemblies, and retaining said mold closed until said liquid foamable thermosetting resin material foams, cures and unites to the preform to form a rigid foamed plastic sandwich ski structure.

2. In a method as in claim **1**, wherein said top subassembly comprises a top plastic running surface and a first strip of aluminum adhered to the underside of said top plastic running surface, said top subassembly being inverted in said mold, said bottom subassembly comprising a plastic bottom running surface having a pair of steel edges adhered to opposite side edges thereof and a second strip of aluminum adhered to the top surface of said bottom running surface, said bottom subassembly being inverted in said mold, and said corrugated laminate is constructed from narrow strips of paper oriented perpendiculr to said top and bottom subassemblies, said corrugated member having a thickness in excess of said desired core thickness whereby the same is partially crushed when said mold is closed while still bearing against said top and bottom subassemblies to space them from each other to said desired core thickness and said foamable thermosetting resin material has glass micro-balloons added thereto.

4,044,084

METHOD OF REMOVING AN ARTICLE FROM A CHAMBER HAVING A REDUCED PRESSURE THEREIN

Arthur L. Phipps, 6204 Raymond Court, Erie, Pa. 16505

Filed Aug. 11, 1975, Ser. No. 603,715

Int. Cl.[2] B29D *27/00*

U.S. Cl. 264—51 **2 Claims**

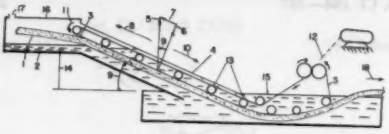
1. In a method of producing a low density foamed thermoplastic resin article by extruding a foamable thermoplastic resin into a chamber at subatmospheric pressure and withdrawing the foamed thermoplastic resin extrudate from said chamber into the atmosphere, the improvement comprising,

providing a vacuum chamber with means to evacuate it,

a barometric leg connected to said vacuum chamber and terminating in a pool of liquid open to the atmosphere,

the density of the liquid being greater than the density of said foamed thermoplastic resin extrudate and the barometric leg having a conveyor therein extending from the vacuum chamber into said pool of liquid,

conveying said extrudate from said chamber without substantial tension sufficient to deform said extrudate into said pool of liquid whereby said workpiece floats up into



engagement with said conveyor and moving said extrudate with said conveyor into said pool of liquid and through said liquid out into said atmosphere,

said conveyor having a relatively flat underside inclined at an acute angle to the horizontal such that friction between the workpiece and the conveyor is sufficient to cause said extrudate to move along with the conveyor through said pool of liquid.

4,044,085

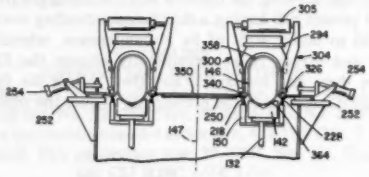
METHOD FOR FORMING A TUBE ARTICLE ON A CORE

Charles E. Grawey, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 385,956, Aug. 6, 1973, abandoned. This application June 20, 1975, Ser. No. 588,732

Int. Cl.² B29C *17/04;* **B29H** *15/00*

U.S. Cl. 264—90 **9 Claims**



1. A method of forming a portion of a tube on a toroidal core comprising the steps of: positioning a sheet of elastomeric material adjacent the toroidal core along one side thereof; depositing elastomeric material of said sheet thereof onto said toroidal core along a continuous path thereof; and applying force to an annular portion of elastomeric material associated with said core to urge said annular portion of elastomeric material against the core, independent of any force used to initially deposit said elastomeric material of said sheet onto said core along said continuous path thereof, wherein the step of applying force to the annular portion of the elastomeric material comprises the step of applying said force adjacent a continuous edge of the so-deposited elastomeric material, and further comprising the step of cutting away elastomeric material not deposited on the core adjacent and about said continuous edge of the so-deposited elastomeric material, and further comprising the step of applying force to an extended portion of elastomeric material extending from the so-deposited elastomeric material subsequent to said cutting to force said extended portion thereof against the core, wherein the step of applying force to the annular portion of elastomeric material comprises the step of selectively moving a movable member into contact with the annular portion of the elastomeric material, and wherein the step of applying force to the extended portion of elastomeric material comprises the step of moving said movable member into continuous annular contact with said extended portion.

4,044,086

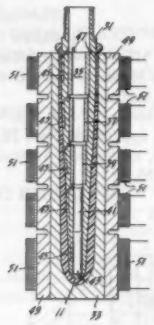
METHOD FOR MAKING A BLOW MOLDED ORIENTED PLASTIC BOTTLE

Charles Edmund McChesney, Monmouth Junction; Robert J. McHenry, Belle Mead, and James Alan Wachtel, Princeton, all of N.J., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 319,380, Dec. 29, 1972, Pat. No. 3,934,743. This application July 21, 1975, Ser. No. 597,678

Int. Cl.² B29C *17/07*

U.S. Cl. 264—97 **11 Claims**



1. A method for making a self-supporting biaxially oriented container having a substantially uniform high degree of orientation radially of the sidewall of the container comprising the steps of forming a parison having a tubular sidewall with inner and outer surfaces from a glassy, essentially non-crystalline thermoplastic polymeric material which is capable of being biaxially oriented during blow molding, temperature conditioning the parison to establish between the inner and outer surfaces of the sidewall of the parison outwardly radially decreasing temperatures within the orientation temperature range of the polymeric material, the decreasing temperatures being related to the radially outwardly decreasing degree of blow molding induced stretch so as to achieve substantial radial uniformity of orientation and blow molding the temperature conditioned parison to stretch the polymeric material of the parison to the container shape and to biaxially orient the material.

4,044,087

METHOD OF MAKING FAST CURED LIGNOCELLULOSIC PARTICLE BOARD

Paul Robitschek, and Ross L. Christensen, both of Eugene, Oreg., assignors to Chembond Corporation, Springfield, Oreg.

Division of Ser. No. 457,438, April 3, 1974, Pat. No. 3,968,294. This application Jan. 2, 1976, Ser. No. 646,410

Int. Cl.² B29J *5/00*

U.S. Cl. 264—113 **5 Claims**

1. The method of making lignocellulosic particle board, comprising:

a. mixing a first portion of lignocellulose particles with from 3 to 15% by weight, dry solids basis, of an acid catalyzed, phenol aldehyde thermosetting resin having a pH of less than 2,

b. mixing a second portion of lignocellulose particles with from 3 to 15% by weight, dry solids basis, of an alkali catalyzed, phenol aldehyde thermo-setting resin having an alkaline pH of not more than about 13

c. forming a laminar mat having a middle lamina of the mixture of said first portion of particles and acid catalyzed resin and opposed outer surface laminae of the mixture of said second portion of particles and alkali catalyzed resin, each other surface lamina being at least 0.025 inch in thickness, and

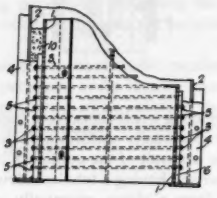
d. subjecting the laminar mat to heat and pressure sufficient to consolidate it to predetermined density and thickness and cause the resins to cure and bond the particles into a unitary structural board.

4,044,088

STRESSED HOLLOW CONCRETE CYLINDERS

Graeme Reginald Hume, 5 Ian's Grove, Lower Templestowe, 3107 Victoria, Australia

Continuation-in-part of Ser. No. 386,619, Aug. 9, 1973, abandoned. This application Nov. 25, 1975, Ser. No. 635,224
Claims priority, application Australia, Aug. 10, 1972, 36/72; July 30, 1975, 2565/75
Int. Cl.[2] B28B *23/12*
U.S. Cl. 264—130 **9 Claims**



1. A method of producing a concrete pipe comprising the steps of:

substantially continuously coating a stressable tendon with an anti-bonding material, the inner radius of the anti-bonding material being substantially equal to the outer radius of the tendon, such that the outer surface of said tendon closely contacts the inner surface of said anti-bonding material with no gaps present therebetween, said anti-bonding material being of sufficient strength to withstand without failure the compressive load applied thereupon by said tendon to preclude relative radial movement of said tendon with respect to said coating material to the point where said tendon contacts said concrete while assuring low friction relative circumferential movement of said tendon with respect to the cured concrete,

installing at least one coated unstressed tendon in a concrete pipe mould prior to pouring of concrete, the tendon extending substantially concentrically relative to the walls of the mould and being secured to tendon anchorages positiond within the mould, said mould having at least one longitudinal divider so that the pipe to be cast therein has at least one longitudinal split, portions of said tendon lying on both sides of said split and being connected together across said split,

pouring concrete into said mould to substantially completely immerse said tendon and said anchorages in said concrete except for those points wherein said tendon passes through said longitudinal split, so that concrete surrounds and intimately contacts said coating material with no gaps therebetween to preclude relative radial movement of said coating material with respect to said concrete after curing the concrete in the mould,

expanding said pipe radially outwardly to cause circumferential movement of said tendon with respect to the cured concrete to thereby stress the tendon, and

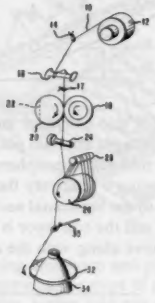
filling the split in said pipe with a filler to form a substantially continuous stressed cylinder.

4,044,089

PROCESS AND APPARATUS FOR PRODUCING THICK AND THIN FILAMENTS

Stanley Robert Cochran, Harrisonburg, and Oren Hardin Davis, Axton, both of Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 13, 1976, Ser. No. 686,644
Int. Cl.[2] D02J *1/22;* B29C *17/02*
U.S. Cl. 264—167 **2 Claims**



2. A process for continuously drawing an undrawn filament to produce thick and thin sections along its length comprising: passing the filament while under a tension of from about 0.005 to about 0.015 grams per denier into the nip of a feed roll assembly comprising rotating driven presser and feed rolls; removing said filament from said nip under tension, the filament being in a single plane as it enters, passes through and exits the nip; drawing the filament and collecting the filament, the said presser roll having a depression extending over from about 10 to about 40% of its circumference, whereby the presser and driven rolls intermittently engage the filament between them and forward it and then release the filament when the depression of the presser roll is over the filament.

4,044,090

PROCESS FOR PRODUCING REGENERATED CELLULOSIC PRODUCT

Norman A. Portnoy, Hopatcong, N.J., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed July 9, 1975, Ser. No. 594,325
Int. Cl.[2] C08B *5/00, 16/00;* D01F *2/28*
U.S. Cl. 264—187 **9 Claims**

1. A process for producing a regenerated cellulosic product comprising

nitrosating and dissolving a cellulosic material in a solution comprising a dialkylacylamide solvent and adding from 2–25% by weight of the solution of a tertiary amine to form a soluble cellulose nitrite ester, forming the cellulose ester into a filament or other shape,

contacting the cellulose ester with a coagulant therefore,

stretching the coagulated cellulose ester prior to complete regeneration thereof, and

completing the regeneration of the cellulose,

4,044,091
SEPARATOR FOR CONCRETE WRAPPING TO SUBMARINE PIPELINES

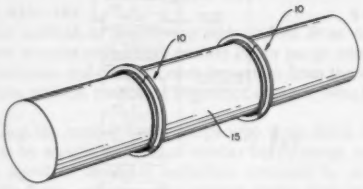
John Hurst, London, England, assignor to W. R. Grace Limited, London, England

Division of Ser. No. 674,693, April 7, 1976. This application Nov. 4, 1976, Ser. No. 738,804

Claims priority, application United Kingdom, May 20, 1975, 21596/75

Int. Cl.² B28B *23/08*

U.S. Cl. 264—251 13 Claims



1. A method of applying concrete cladding to pipes wherein spaces each comprising in combination a base flange having opposed sides, a web extending generally perpendicularly from the base flange from one said side, the cross-section of the spacer being generally T-shaped, the spacer being flexible, the web being compressible and the web being at least as resistant to bending adjacent the base flange as at positions remote from the base flange, are positioned at intervals along the pipe such that the side of the flanges of said spacers opposite the sides from which said webs extend are adjacent the pipe, and concrete is sprayed onto the pipe to form discrete sections separated by the spacers.

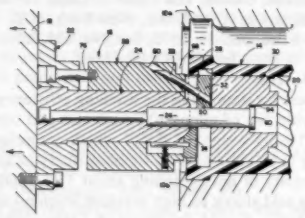
4,044,092
GROOVE MOLDING METHOD

Wayne Spears, 12884 Bradley Ave., Sylmar, Calif. 91342

Division of Ser. No. 528,259, Nov. 29, 1974, Pat. No. 3,966,385, which is a continuation-in-part of Ser. No. 422,776, Dec. 7, 1973, abandoned. This application Apr. 29, 1976, Ser. No. 681,705

Int. Cl.² B29C *1/14, 1/14*

U.S. Cl. 264—318 18 Claims



1. A method for molding an annular groove internally in a tubular molded part, said method comprising:

a. providing a mold core assembly having an outer mold surface and a plurality of first mold segments forming a first group and a plurality of second mold segments forming a second group thereof circumferentially around and intermediate the ends of the mold core,

b. introducing said mold core assembly into a mold cavity,

c. molding a part in said cavity and radially expanding said first and second groups of segments to form a recess in the molded part,

d. moving the first group of segments radially inwardly until they are fully withdrawn from the recess,

e. initiating axial movement of the first group of segments relative to the second group of segments after being withdrawn from said recess,

f. moving the second group of segments radially inwardly until they are fully withdrawn from the recess, and which radial movement of the second group of segments starts approximately when or without substantial delay after said first group of segments starts said axial movement,

g. initiating axial movement of the second group of segments, and

h. removing the molded part from the cavity.

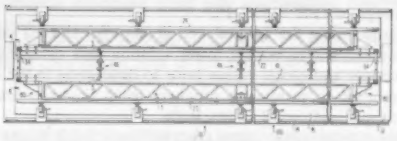
4,044,093
FLAT CHORD TRUSS JIG ASSEMBLY

John Calvin Jureit, Coral Gables, and Adolfo Castillo, Miami, both of Fla., assignors to Automated Building Components, Inc., Miami, Fla.

Filed Sept. 26, 1974, Ser. No. 509,568

Int. Cl.² B23Q *3/00*

U.S. Cl. 269—321 F 7 Claims



1. A jig assembly for holding wooden members in predetermined positions for forming a truss comprising:

an elongated jig pad, a pair of generally parallel guide bars carried by said pad at spaced locations one from the other and defining abutments substantially coextensive in length with the length of respective upper and lower chords of a truss disposed between said bars, and means carried by said pad at least at one end of the jig assembly and located between said bars forming a stop for the ends of the chords disposed between said bars, said jig assembly being constructed such that the first and second pairs of bars define inner and outer pairs thereof, the first mentioned camber forms means including an element engaging between the inner pair of bars, and means cooperable between said element and said inner pair of bars for displacing said inner pair of bars toward one another and to substantially simultaneously form a camber in said inner pair of guide bars.

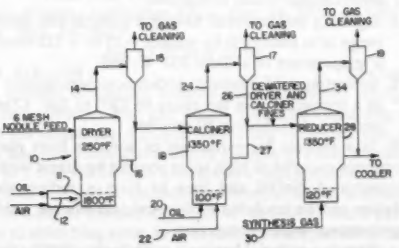
4,044,094
TWO-STAGE FLUID BED REDUCTION OF MANGANESE NODULES

Herbert E. Barner, Westford; David S. Davies, Andover, both of Mass., and Lester J. Szabo, Prince Edward Island, Canada, assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Aug. 26, 1974, Ser. No. 500,493

Int. Cl.² C01G *3/14, 53/12;* C22B *5/18*

U.S. Cl. 423—32 48 Claims



31. A process for recovering metal values selected from the

group consisting of copper and nickel from a manganese ore containing copper and nickel base metal values comprising the steps of:

a. drying the ore in a fluid bed dryer to remove free moisture from the ore producing an off gas from which scrubber fines can be recovered in a scrubber;

b. calcining the dried ore in a fluid bed calciner under a neutral or oxidizing atmosphere to remove remaining free moisture and combined moisture and to convert MnO_2 in the ore to intermediate oxides of manganese producing an off gas from which scrubber fines can be recovered in a scrubber;

c. delivering the calcined ore to a fluid bed reducer and reducing the calcined ore in the fluid bed at a temperature between the range of 1200°–1500° F to convert the oxides of the manganese in the ore to MnO;

d. forwarding scrubber fines recovered from the off gases from the fluid bed dryer and fluid bed calciner directly to the fluid bed reducer to enable the temperature in which the ore is reduced in step (c) to be maintained between the range of 1200°–1500° F;

e. introducing the ore reduced in steps (c) and (d) into an ammonium carbonate leach solution and oxidizing the copper and nickel values prior to dissolution in the leach solution to produce a pregnant leach liquor containing copper and nickel values; and,

f. recovering metal values from pregnant leach liquor.

4,044,095

PROCESS FOR RECOVERY OF ALUMINA FROM HIGH-SILICA ORE

Lawrence Keith Hudson, Oakmont, Pa.; Kenneth I. Savage, Downers Grove, and John M. Stinson, Jr., Belleville, both of Ill., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 20, 1975, Ser. No. 623,931
Int. Cl.[2] C01F 7/06, 7/04
U.S. Cl. 423—127 **8 Claims**

1. In a process for extraction of alumina from particulate aluminous material of high silica content by a digest with highly concentrated NaOH and lime to form a sodium-aluminate solution and an insoluble sodium-calcium-silicate residue, the improvement which comprises:

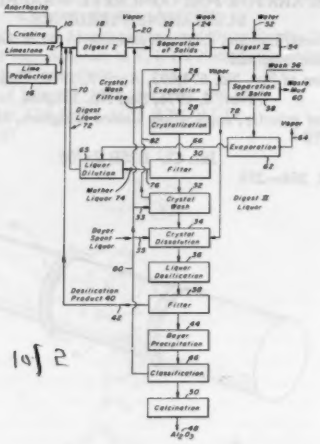
a. digesting said material having a particle size distribution range of at least 80% by weight −35 to +325 mesh and at a temperature of at least 200° C; and

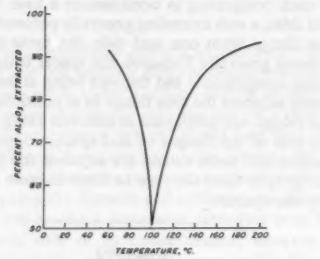
b. separating said insoluble sodium-calcium-silicate residue at a temperature in the range of 120° to 200° C in a time period not exceeding 60 minutes.

8. In a process for extraction of alumina from particulate aluminous material of high silica content by digest with highly concentrated NaOH and lime to form a sodium-aluminate solution and an insoluble sodium-calcium-silicate residue, the improvement which comprises:

a. digesting material having a particle size distribution range of at least 80% by weight −35 to +325 mesh and at a temperature of at least 200° C; and

b. separating said insoluble sodium-calcium-silicate residue





at a temperature below about 80° C in a time period not exceeding 60 minutes.

4,044,096

SULFURIC ACID LEACHING OF NICKELIFEROUS LATERITE

Paul B. Queneau, Golden, and Eddie C. Chou, Arvada, both of Colo., assignors to AMAX Inc., New York, N.Y.

Filed Dec. 11, 1975, Ser. No. 639,712
Int. Cl.[2] C01G 53/10
U.S. Cl. 423—150 **11 Claims**

1. A process for improving the leaching efficiency of nickeliferous lateritic ore of minus 100 mesh size and containing at least about 1% by weight of nickel which comprises,

providing in an autoclave an aqueous slurry of said ore at a pulp density of not exceeding about 33% solids,

subjecting said slurry to high pressure leaching in a sulfuric acid solution in said autoclave at a temperature of over 260° C and ranging up to about 290° C at a pressure of about 700 psig to 1000 psig at an agitation rate sufficient to suspend solids in said slurry,

the amount of sulfuric acid being injected in said autoclave in a single addition and corresponding to an acid-to-ore ratio ranging from about 0.2 to 0.35, the leaching time being sufficient to leach at least about 95% of said nickel,

and then discharging the leached slurry into a flash tank such that the slurry is subjected to turbulence due to the release of autoclave pressure during flashdown, the slurry being then neutralized during said turbulence to a pH of at least about 1.8 but not exceeding about 4.5 to precipitate iron and aluminum and thereby inhibit dissolution of precipitated iron and alumi-

num downstream of said process and provide a pregnant solution having a nickel to Fe+Al+Cr ratio exceeding 2.

4,044,097

RECOVERY OF SODA VALUES FROM SODIUM CARBONATE CRYSTALLIZER PURGE LIQUORS

Alan B. Gancy, and Rustom P. Poncha, both of Syracuse, N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Division of Ser. No. 587,581, June 17, 1976, Pat. No. 3,991,160. This application Sept. 16, 1976, Ser. No. 723,681

Int. Cl.[2] C01D *7/24*

U.S. Cl. 423—186 6 Claims

1. The method of recovering soda values from aqueous carbonate process crystallizer mother liquor purge containing soluble silicates and carbonaceous impurities from the process for making sodium carbonate precursor crystals, which comprises:

a. mixing the mother liquor purge with from about 1 to 10 parts by weight, per part of mother liquor purge, as treating agent of insoluble impurities obtained by crushing crude trona, calcining the crushed trona, dissolving the calcined trona comprising sodium carbonate and insoluble impurities in an aqeuous medium followed by separation of insoluble impurities;

b. evaporating the mixture to dryness and calcining at temperature of 300° to 600° C. for time sufficient to insolubilize soluble silicates and to reduce contamination with carbonaceous impurities; and

c. leaching the calcined mixture with water or aqueous sodium carbonate solution to recover sodium carbonate values therefrom.

4,044,098

REMOVAL OF MERCURY FROM GAS STREAMS USING HYDROGEN SULFIDE AND AMINES

Alvin J. Miller, and William F. Tuckett, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 18, 1976, Ser. No. 687,476

Int. Cl.[2] B01D *47/00;* B01J *8/00;* C01B *17/20*

U.S. Cl. 423—210 9 Claims

6. A process for treating a gas stream that contains mercury thereby producing a gas stream with reduced mercury content and minimal sulfur content, said process comprising contacting said mercury-containing gas stream with an amine capable of absorbing hydrogen sulfide with the amine containing an amount of hydrogen sulfide sufficient to precipitate the mercury contained in the gas stream, said amine in an amount sufficient to retain hydrogen sulfide in excess of the amount required to precipitate said mercury.

4,044,099

POLLUTED AIR EFFLUENT INCINERATING METHOD

Lawrence C. Griffin, Seattle, Wash., assignor to Griffin Research & Development, Inc., Miami, Fla.

Division of Ser. No. 397,947, Sept. 17, 1973, Pat. No. 3,960,504. This application May 20, 1976, Ser. No. 688,355

Int. Cl.[2] A61L *9/00;* F23G *7/06*

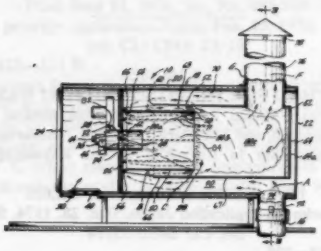
U.S. Cl. 423—210 6 Claims

1. A process for incinerating a polluted air effluent, said process comprising:

a. directing fuel and unpolluted primary air as a reacting fuel-air mixture in a downstream direction axially through a confined generally cylindrical combustion area comprising a first combustion zone, a second intermediate combustion zone coaxially downstream of said first combustion zone and a third final combustion zone coaxially downstream of said second combustion zone,

b. directing a portion of the polluted air effluent into said intermediate combustion zone in a flow pattern annularly surrounding and flowing generally coaxially with the combustion products emerging from said first combustion zone,

c. directing additional polluted air effluent into said final combustion zone in a flow pattern annularly surrounding



and flowing generally coaxially with the combustion products emerging from said intermediate combustion zone, and

d. discharging the combustion products exhausting from said third combustion zone to the atmosphere.

4,044,100

SEPARATION OF ACIDIC GAS CONSTITUENTS FROM GASEOUS MIXTURES CONTAINING THE SAME

Paul L. McElroy, Jr., Morristown, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 883,338, Dec. 8, 1969, abandoned, which is a continuation-in-part of Ser. No. 445,774, April 5, 1965, abandoned. This application Mar. 29, 1972, Ser. No. 239,366

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—226 12 Claims

1. A method of separating carbon dioxide from a gaseous mixture containing same which comprises contacting the gaseous mixture in an absorption zone with a liquid solvent comprising a solution of from 10 to 65% by weight of di-isopropanolamine and of from 35 to 90% by weight of a normally liquid dialkalyl ether of a polyalkalylene glycol under conditions which effect absorption of the carbon dioxide in the solvent while controlling temperature at above about 15° to 90° C. and total pressure between about 50 and 1500 pounds per square inch gauge such as to maintain said solvent as a single phase.

4,044,101

METHOD OF TREATING EXHAUST GASES CONTAINING NITROGEN OXIDES AND SULFUROUS ACID GAS

Tokuichi Hisamatsu; Taketsugu Kitamura; Takeshiro Saito; Hitoshi Takagi, and Takuzo Sekiya, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 17, 1975, Ser. No. 641,870

Claims priority, application Japan, Dec. 21, 1974, 49-147172; Feb. 17, 1975, 50-19617

Int. Cl.[2] C01B *21/00*

U.S. Cl. 423—235 17 Claims

1. A method of treating exhaust gases containing nitrogen oxides and sulfurous acid gas which comprises contacting an exhaust gas containing nitrogen oxides and sulfurous acid gas with an aqueous solution containing a sulfite in a concentration of 0.05 to 1.0 mole/liter, an iron ion in a concentration of 0.01 to 0.7 g-ion/liter and an aminopolycarboxylic acid in a concentration of 0.005 to 2.0 moles/liter at 40° to 100° C. and a pH of 4 to 9 in an absorbing zone, so as to remove nitrogen oxides and sulfurous acid gas from said exhaust gas and form a dithionate in the absorbing solution and treating the absorbing solution from the absorbing zone at 40° to 100° C. for 1 to 30 minutes in

a reducing zone while insulating the absorbing solution from contact with the exhaust gas, so as to reduce at least a portion of the absorbed nitrogen oxides to N_2, iron ion to ferrous ion and form further dithionate.

4,044,102

METHOD FOR TREATING EXHAUST GASES

Ryoji Muraki; Masao Endo, both of Nishinomiya; Nobuaki Aoki, Hirakata, and Masahiro Takeshita, Nishinomiya, all of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Japan

Filed Dec. 19, 1975, Ser. No. 642,625
Claims priority, application Japan, Dec. 28, 1974, 50-3228
Int. Cl.² B01D *53/34*
U.S. Cl. 423—239 6 Claims

1. In a continuous method of removing nitrogen oxides and dust from flue gases formed by the combustion of fuel which comprises passing the flue gas, in admixture with ammonia, through a fixed particulate catalyst bed capable of reducing nitrogen oxides in the presence of ammonia, wherein said nitrogen oxides are reduced and said dust is retained by the catalyst bed thereby increasing the gas passage pressure, the improvement which comprises:

a. continuously or intermittently discharging a portion of the particulate catalyst and accumulated dust from said bed at a rate between about 10 to 100 mm per hour per 500 to 10,000 mm of catalyst bed height, which rate is sufficient to prevent plugging of the catalyst bed, while feeding catalyst into the catalyst bed in an amount that compensates for the amount of catalyst removed,

b. heating of the catalyst discharged from said bed to reactivate said catalyst and remove a gas therefrom,

c. separating the reactivated catalyst from the dust, and

d. returning the regenerated catalyst to the catalyst bed.

4,044,103

STORAGE-STABLE SODIUM CHLORITE

Paul Mollard, Sainte Foy les Lyon, and Louis Mesaros, Ouillins, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jan. 16, 1974, Ser. No. 433,659
Claims priority, application France, Feb. 5, 1973, 73.03917
Int. Cl.² C01B *11/10*
U.S. Cl. 423—267 13 Claims

1. A method for stabilizing sodium chlorite which comprises the steps of

1. admixing with sodium chlorite slurry an amount of stabilizing inorganic alkali metal or alkaline earth metal salt chemically inert to sodium chlorite and having at least one hydrate whose melting point is higher than about 50° C., the amount being sufficient to capture in the hydrate form a quantity of water equal to at least 5% of the weight of the sodium chlorite and insufficient to inordinately diminish the effective chlorite level, and the weight of water in the total mixture being at least 5% of the weight of said sodium chlorite; and

2. drying the mixture sufficiently at a temperature within the thermal stability temperatures of the hydrated stabilizing salt and the sodium chlorite, to reudce the water not captured to an amount not greater than about 2% of the weight of said sodium chlorite with, when noncaptured water is present, the mixture being comprised of granules having a diameter of at least about 2mm and the amount of uncaptured water being insufficient to form the trihydrate of the sodium chlorite salt.

4,044,104

PRODUCTION OF PHOSPHORUS NITRIDES

Joseph Cremer, Hurth-Hermulheim; Egon Joerchel, Hochheim am Main, and Heinz Harnisch, Cologne-Lovenich, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 13, 1976, Ser. No. 676,467
Claims priority, application Germany, Apr. 17, 1975, 2516915; Feb. 27, 1976, 2608018
Int. Cl.² C01B *21/06, 25/00*
U.S. Cl. 423—302 5 Claims

1. In the process for making phosphorus nitrides of the general formula PN_x, in which x stands for a number of 0.9 to 1.7 by reacting phosphorus halides with ammonia and heating the resulting reaction product, the improvement which comprises reacting the phosphorus halides with the ammonia in the gas phase at temperatures between the boiling or sublimation point of the phosphorus halides and 250° C, the ammonia being used in excess, based on the phosphorus halides, and after-heating the resulting reaction product to temperatures of 500° to 950° C until ammonia substantially ceases to be evolved from the reaction product whereby PH_x is obtained in yields of about 97 percent based on phosphorus.

4,044,105

PROCESS FOR PREPARATION OF CALCIUM HYDROGEN PHOSPHATE ANHYDRIDE

Takamitsu Enomoto; Motoshige Ogura, and Tetsuhiro Ono, all of Ube, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Jan. 28, 1976, Ser. No. 653,036
Claims priority, application Japan, Jan. 29, 1975, 50-11424
Int. Cl.² C01B *15/16, 25/26*
U.S. Cl. 423—308 10 Claims

1. A process of preparing highly pure calcium hydrogenphosphate anhydride in the form of platy crystals of uniform particle size, the process comprising the steps of:

preparing calcium hydrogenphosphate dihydrate by preparing a first aqueous solution of sodium ammonium hydrogenphosphate of commercial grade in a concentration of about 5% by weight on the basis of P_2O_5;

preparing a second aqueous solution of calcium chloride in a concentration of 20% by weight at the highest on the basis of $CaCl_2$;

mixing said first aqueous solution with said second aqueous solution by showering said first and second aqueous solutions into a vessel; the quantities of said first and second aqueous solutions being determined such that the molar ratio expressed by Ca/P is in the range of from 1.05 to 1.20, the pH of the mixture being adjusted such that the pH of the mixture at the end of the mixing step is in the range from 5.0 to 5.8;

preparing an aqueous slurry of said calcium hydrogen-phosphate dihydrate in a concentration ranging from 5 to 20% by weight;

adjusting the pH of said slurry to a value in the range from 4.5 to 5.5; and

flowing said slurry on a sloping and convex surface as a thin layer stream and blowing steam against the flowing slurry to rapidly heat said slurry to a temperature in the range of 85° to 97° C.

4,044,106

RECLAMATION OF PHOSPHATE FROM BRIGHT DIP DRAG-OUT

Albert Yi-Hung Fang, 8542 Wildwood Ave., Westland, Mich. 48185

Filed Oct. 15, 1975, Ser. No. 622,472
Int. Cl.² C01B *15/16;* B08B *7/04*
U.S. Cl. 423—312 12 Claims

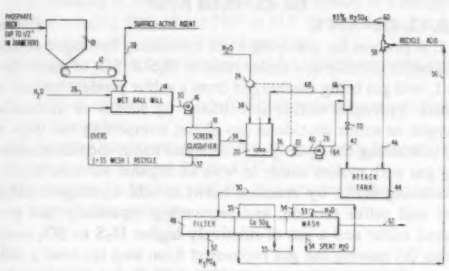
1. The method of recovering phosphate values from waste aqueous acid solutions generated in aluminum bright dip oper-

ations of the type containing phosphoric acid in combination with appreciable amounts of dissolved aluminum phosphate and nitric acid which comprises the steps of reacting said waste aqueous acid solution with an alkali material selected from the group consisting of sodium hydroxide and a combination of sodium hydroxide and sodium carbonate in a manner to convert substantially all of the aluminum phosphate to sodium aluminate and trisodium phosphate, said nitric acid to sodium nitrate, and substantially all of said phosphoric acid to trisodium phosphate; said sodium aluminate, sodium nitrate and trisodium phosphate present in the form of dissolved salts in the liquid aqueous reaction solution, removing a portion of said trisodium phosphate from said aqueous reaction solution by crystallization while retaining said sodium aluminate and said sodium nitrate in the form of solubilized salts in the remaining mother liquor, and thereafter separating the crystallized trisodium phosphate from said mother liquor.

4,044,107
PROCESS FOR THE MANUFACTURE OF WET PROCESS PHOSPHORIC ACID USING WET-GRINDING OF THE PHOSPHATE ROCK FEED

Samuel V. Houghtaling, Lakeland, Fla., assignor to Davy Powergas, Inc., Lakeland, Fla.

Continuation of Ser. No. 416,647, Nov. 16, 1973, abandoned.
This application July 21, 1975, Ser. No. 597,337
Int. Cl.[2] C01B *25/16*
U.S. Cl. 423—320 6 Claims



1. A method of manufacturing wet process phosphoric acid from phosphate rock, comprising the steps of

i. grinding the phosphate rock in a water slurry sufficiently that the phosphate rock will pass a 30 mesh (Tyler) screen, said slurry containing at least about 20 weight percent water, and said slurry being formed with water containing no more than 2 percent P_2O_5;

ii. passing the slurry of ground rock to an attack tank and therein contacting and reacting the slurry with diluted sulfuric acid obtained from step (vi) herein to yield a product slurry of crystalline hydrated calcium sulfate in phosphoric acid having a P_2O_5 value of at least about 25 weight percent, said slurry providing about 15 to 35 weight percent of the water present in said attack tank;

iii. removing said product slurry from the attack tank;

iv. subjecting said product slurry to a separation step whereby the crystalline hydrated calcium sulfate is separated from the phosphoric acid;

v. washing the separated calcium sulfate with water and obtaining spent wash water having a P_2O_5 value of about 15 to 25 weight percent;

vi. mixing the spent calcium sulfate wash water with concentrated sulfuric acid having a concentration of at least about 90 percent to obtain diluted sulfuric acid; and

vii. passing the diluted sulfuric acid to step (ii) above to supply about 60 to 85% of the total amount of water in the attack tank, said concentrated sulfuric acid supplying up to about 5 percent of the water present in said attack tank.

4,044,108
PROCESS FOR REMOVING ORGANIC MATERIAL FROM WET PROCESS PHOSPHORIC ACID

Mitsuo Kikuchi, and Yoichi Hiraga, both of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed June 11, 1976, Ser. No. 695,310
Claims priority, application Japan, Feb. 13, 1976, 51-13948
Int. Cl.[2] C01B *25/16*
U.S. Cl. 423—321 R 10 Claims

1. A process for removing organic material from extracted phosphoric acid, which comprises: contacting extracted phosphoric acid containing metallic impurities in trace amounts with a chlorate and hydrochloric acid at a temperature greater than 100° C while maintaining the concentration of the extracted phosphoric acid at a value greater than 90 wt.% as H_3PO_4.

4,044,109
PROCESS FOR THE HYDROCHLORINATION OF ELEMENTAL SILICON

Han-Joachim Kötzsch, Rheinfelden; Hans-Jöachim Vahlensieck, Wehr, Baden, and Walter Josten, Rheinfelden, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Dec. 17, 1974, Ser. No. 533,740
Claims priority, application Germany, Dec. 31, 1973, 2365273
Int. Cl.[2] C01B *33/08*
U.S. Cl. 423—342 9 Claims

1. In a process for preparing a mixture of $SiCl_4$ and $SiHCl_3$ wherein elemental silicon is contacted with HCl in a fluidized bed, the improvement which comprises carrying out the process in the presence of an iron compound, which iron compound is present in an amount such that when calculated as iron the iron content is 10 to 43 weight percent based on the weight of the total solids in the fluidized bed, at a temperature in the range of 260° to 600° C.

4,044,110
METHOD OF FORMING A SILICON CARBIDE ARTICLE - III

Jack E. Noakes, Plymouth Township, Wayne County, Mich.; Hiroshi Sato, West Lafayette, Ind., and Leslie L. Terner, West Bloomfield Township, Oakland County, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 3, 1975, Ser. No. 619,427
Int. Cl.[2] C01B *31/36*
U.S. Cl. 423—346 2 Claims

1. In a method of forming a silicon carbide article: (a) wherein 60–80% by weight of silicon carbide particles having an average particle size in the range from about 40 microns to less than 1 micron are mixed together with 40–20% by weight of a thermosetting binder which produces a flowable liquid phase when melted and which produces carbon upon nonoxidative pyrolysis; (b) wherein the mixture is heated to a temperature whereat the thermosetting binder is in a liquid phase; (c) wherein the mixture is injected molded by an injection molding technique to form an article, the injection molding technique operating on the basis that the flowable thermosetting binder forms a continuous phase about the silicon carbide particles supported therein; (d) wherein the thermosetting binder is stiffened to lend sufficient strength to the molded article so that it may be removed from its mold; (e) wherein the molded article is pyrolized in the absence of oxygen so that the thermosetting binder undergoes a volumetric reduction in breaking down to form a vitreous carbon phase which serves to bond silicon carbon particles together, this action also developing a pore structure throughout the article and producing excess carbon at the surface; and (f) wherein the article is silicided at an elevated temperature by permitting the penetration of the article through its pore structure with silicon whereby the silicon reacts with the available carbon to form silicon carbide; the improvement which comprises:

treating the surface of the article after it has been pyrolized and prior to the siliciding thereof to remove said excess carbon on the surface thereof by heating the article to a treatment temperature in the range from 700° F to 850° F and thereafter exposing the article to an oxygen containing atmosphere for a period of time up to 5 minutes.

4,044,111

METHOD OF TREATING CALCIUM NITRATE CONTAINED IN DENITRATION WASTE LIQUID

Isao Furuta, Mitaka; Hiroshi Tamura, Akashi, and Masami Takao, Kobe, all of Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Filed May 12, 1976, Ser. No. 685,625
Claims priority, application Japan, May 12, 1975, 50-56253
Int. Cl.² C01B *21/00*
U.S. Cl. 423—351 **8 Claims**

1. A method of treating a denitration waste liquid comprising calcium chloride and calcium nitrate which comprises the steps of:

A. adding concentrated sulfuric acid to said denitration waste liquid to obtain a mixed solution including nitric acid, hydrochloric acid, sulfuric acid and calcium sulfate and adjusting the ratio of chloride ions to nitrate ions in said mixed solution within the range of $Cl^-/NO_3^- = 2 - 3$;

B. Adjusting the sulfuric acid concentration in said solution to from 10 to 70 wt.%.

C. heating said mixed solution to 110° to 150° C to generate a mixed gas comprising NOCl, Cl_2 nitrogen oxides, HCl, Cl_2 and HNO_3;

D. passing said mixed gas through a concentrated sulfuric acid which has a concentration of higher than 80% and is maintained at a temperature of 80° to 150° C. to obtain a mixed gas containing chlorine and hydrogen chloride and a nitrosylsulfuric acid solution;

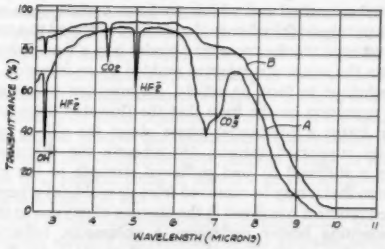
E. introducing a mixed gas of $(SO_2 + H_2O)$ into said nitrosylsulfuric acid to form sulfuric acid and a mixed gas of $(NO + NO_2 + SO_2)$ and thereafter introducing the latter mentioned mixed gas into a reducing solution to convert nitrogen oxides to N_2 gas.

4,044,112

HOT-PRESSABLE MAGNESIUM FLUORIDE POWDER

Robert H. Moss, Cleveland Heights; Carl F. Swinehart, University Heights, and William F. Spicuzza, Eastlake, all of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 447,948, March 4, 1974, Pat. No. 3,920,802. This application Nov. 14, 1975, Ser. No. 632,059
Int. Cl.² C01F *5/28*
U.S. Cl. 423—490 **1 Claim**



1. A pressable magnesium fluoride powder consisting essentially of unground calcined individual particles deformable under sufficient heat and pressure to form an optical body, said powder having a uniform particle size distribution wherein more than 50 percent by weight of said particles is in the size range from about 5 μ to about 62 μ average particle diameter, and more than 33 percent by weight of said particles are greater than 14 μ average particle diameter, said powder having a uniform refractive index of $n_D = 1.3850$ at 20° C, and exhibiting a Debye-Scheurer X-ray pattern indicating the magnesium fluoride powder to be of an amorphous structure.

4,044,113

PREPARATION OF BROMINE

Joseph P. Kleiman, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Feb. 17, 1976, Ser. No. 658,839
Int. Cl.² C01B *7/10*; C07C *17/20*
U.S. Cl. 423—500 **9 Claims**

1. Process for preparing bromine comprising reacting chlorine with ethylene dibromide in the presence of a catalytic quantity of iron halide selected from ferric chloride, ferric bromide and ferric chlorobromides.

4,044,114

PROCESS FOR PURIFYING A GAS CONTAINING SULFUR COMPOUNDS

Claude Dezael, Maisons Laffitte; Sigismond Franckowiak, Rueil Malmaison; Philippe Courty, Colombes, and Henri Gruhier, Chatillon, Bagneux, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Dec. 16, 1975, Ser. No. 641,223
Claims priority, application France, Dec. 27, 1974, 74.43201
Int. Cl.² C01B *17/04*
U.S. Cl. 423—574 R **7 Claims**

1. A process for purifying a gas containing hydrogen sulfide and sulfur dioxide in a molar ratio of H_2S to SO_2 of more than 2 : 1, said gas being discharged from a sulfur production unit in which hydrogen sulfide is oxidized by means of molecular oxygen or sulfur dioxide in gas phase, comprising the steps of (a) contacting the hydrogen sulfide and sulfur dioxide containing gas with molten sulfur or with an organic solvent, thereby producing sulfur by reaction between said hydrogen sulfide and said sulfur dioxide, and recovering separately said produced sulfur and a gas of relatively higher H_2S to SO_2 molar ratio, (b) passing the gas recovered from step (a) over a solid zinc oxide containing mass at 300°–800° C. for absorbing hydrogen sulfide and discharging the resultant H_2S depleted gas, (c) periodically interrupting the contact of the gas with said mass and passing over the same at 400°–1200° C. a gas containing molecular oxygen produced by burning hydrogen sulfide with an excess oxygen containing gas, thereby regenerating the mass, and recovering an SO_2 containing effluent gas, and (d) reacting said effluent gas with hydrogen sulfide in said sulfur production unit thereby producing additional sulfur.

4,044,115

PRODUCTION OF ALUMINA MONOHYDRATE FROM ALUMINUM NITRATE SOLUTIONS

Judith A. Eisele, Verdi; Barlane R. Eichbaum, and Donald J. Bauer, both of Reno, all of Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed July 2, 1976, Ser. No. 702,262
Int. Cl.² C01F *7/30, 7/34*
U.S. Cl. 423—631 **3 Claims**

1. A method for production of alumina monohydrate consisting of treating an aqueous solution of aluminum nitrate containing about 0.5 to 7.2 weight percent aluminum at a temperature of about 250° to 350° C and a pressure of about 500 to 2500 psig for a time sufficient to convert a major proportion of the nitrate to monohydrate, cooling the reaction mixture to room temperature and separating the precipitated alumina monohydrate.

4,044,116

METHOD FOR THE COMPLETE DISSOLUTION OF MINERAL SAMPLES

Kent J. Eisentraut, Xenia, and Shib C. Chattoraj, Fairborn, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 4, 1976, Ser. No. 692,720
Int. Cl.[2] B01F 1/00
U.S. Cl. 423—658.5 3 Claims

1. A method of the complete dissolution of milligram amounts of a sample of minerals which comprises the steps of:
1. adding dropwise about 0.15 to 0.30 ml of hydrofluoric acid to a flat-bottomed beaker containing about 50 to 80 milligrams of the sample in finely divided form spread out over the bottom of the beaker;
2. tilting the beaker so that a major portion of the sample is contacted with the hydrofluoric acid;
3. adding dropwise to the beaker an additional amount of hydrofluoric acid ranging from about 1.5 to 4.0 ml;
4. swirling the beaker so as to ensure contact between the acid and the entire sample;
5. heating the contents of the beaker to a temperature ranging from about 95° to 100° C;
6. swirling the beaker for a period of about 2 to 5 minutes;
7. heating the contents of the beaker to a temperature ranging from about 210° to 215° C;
8. adding dropwise to the beaker about 1.5 to 4.0 ml of a mixture of equal volumes of sulfuric acid and distilled, demineralized water;
9. continuing to heat the contents of the beaker at a temperature ranging from about 210° to 215° C until the volume of the contents is reduced to about 2 ml;
10. rapidly cooling the contents of the beaker to about room temperature;
11. adding about 6 to 10 ml of distilled, demineralized water to the beaker;
12. heating the contents of the beaker to a temperature ranging from about 95° to 215° C; and
13. swirling the beaker until its contents are in the form of a crystal clear solution.

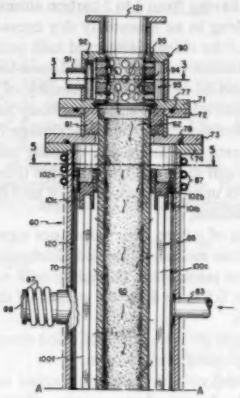
4,044,117

HIGH TEMPERATURE CHEMICAL REACTION PROCESSES UTILIZING FLUID-WALL REACTORS

Edwin Matovich, Brea, Calif., assignor to Thagard Technology Company, Irvine, Calif.

Division of Ser. No. 271,560, July 13, 1972, Pat. No. 3,933,434. This application June 30, 1975, Ser. No. 591,949
Int. Cl.[2] C01B 1/13; C10C 9/42
U.S. Cl. 423—659 17 Claims

1. A high temperature chemical reaction process which comprises:
i. generating an annular envelope of an inert fluid which is substantially transparent to radiation within a shell of a refractory material which reflects radiation; the volume enclosed by the shell constituting a black body cavity, the envelope having substantial axial length and the interior of the envelope defining a reaction chamber;
ii. passing at least one reactant into the black body cavity and through the reaction chamber along a predetermined path substantially coincident with the longitudinal axis of the envelope, the reactants being confined within the reaction chamber; and
iii. directing high intensity radiant energy into the reaction chamber to coincide with at least a portion of the predetermined path of the reactants, sufficient radiant energy being absorbed within the reaction chamber to raise the



temperature of the reactants to a level required to initiate and sustain the desired chemical reaction.

4,044,118

SOLUBILIZING PROCESS FOR OIL INSOLUBLE PESTICIDES

Frederick C. McCoy, Beacon, N.Y., and Carl Loyal W. Swanson, deceased, late of Hopewell Junction, N.Y., by Viola C. Swanson, executrix, assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 470,686, May 16, 1974, Pat. No. 3,939,272, which is a continuation-in-part of Ser. No. 275,680, July 27, 1972, Pat. No. 3,914,808. This application Sept. 24, 1975, Ser. No. 616,228
Int. Cl.[2] A01N 9/36
U.S. Cl. 424—200 6 Claims

1. A process for converting a normally oil-insoluble N-[1-halomethyl-1-(S-dialkylphosphorodithioate)]methinyl phythalimide pesticide wherein said alkyl group of said dialkylphosphorothioate contains 1 to 2 carbon atoms, to their oil-soluble form by:
a. admixing each mole of said pesticide to be converted to oil-soluble form with:
b. a molar excess of at least one alkylate phenol wherein the alkyl substituent contains from 3 to 30 carbon atoms, at temperatures ranging from about 20° C to 100° C, until said normally oil-insoluble compounds are converted to their oil-soluble form.

4,044,119

METHOD OF CONTROLLING RELEASE OF MEDICAMENT AND BOLUS THEREFOR

Arthur Carlson, Jr., Overland Park, and Billy D. Rupe, Leawood, both of Kans., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Continuation-in-part of Ser. No. 356,717, May 3, 1973, abandoned. This application Nov. 14, 1975, Ser. No. 631,885
Int. Cl.[2] A61K 9/26, 31/18, 9/64
U.S. Cl. 424—22 37 Claims

1. A prolonged release oral dosage drug composition for administration to ruminant animals comprising:
a solid, compressed dosage form of a size and shape to be orally administered to said ruminant animals and containing a medically effective amount of a drug distributed throughout an essentially water-insoluble disintegration resistant, slowly digestible matrix,
said dosage form comprising originally undenatured native milk solids which have been (1) insolubilized in the pres-

ence of the drug added thereto by chemical reaction with an effective quantity of an aqueous solution of a substantially water soluble, volatile, aliphatic aldehyde insolubilizing agent having from 1 to 5 carbon atoms, (2) treated to entrap the drug in an essentially dry cross-linked lattice-like matrix of the aldehyde reacted milk protein solids and containing no more than a residual, non-toxic amount of said agent and an insignificant quantity of moisture, and (3) compressed into a self-sustaining body having a density at least greater than 1 to cause the dosage form to sink in the rumino-reticular fluids and become entrapped in the rumino-reticular sacs for slow digestion thereof by proteolytic enzymes upon administration of said dosage form to a ruminant animal,

said drug being of a type which does not significantly react in a deleterious manner with said aldehydic agent during use thereof to insolubilize the native milk solids and making up about 0.5% to 80% by weight of the compressed dosage form,

there being about 20% to 99.5% of dried reacted milk solids in said compressed dosage form,

the ratio of aldehydic insolubilizing agent to milk protein solids and the degree of compression of said reacted milk solids and drug into said dosage form being correlated to provide a densified body which resists total disintegration when tumbled in water at a temperature of about 37° C. for a time period exceeding about 24 hours.

4,044,120

COMPOUNDS HAVING A PHYSIOLOGICAL COOLING EFFECT, AND COMPOSITIONS CONTAINING THEM

David G. Rowsell, Staines, and Roger Hems, Maidenhead, both of United Kingdom, assignors to Wilkinson Sword Limited, London, England

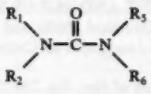
Filed Apr. 16, 1975, Ser. No. 568,663

Claims priority, application United Kingdom, Apr. 17, 1974, 16803/74

Int. Cl.[2] A61K *9/68*

U.S. Cl. 424—48 **8 Claims**

1. In a manufactured consumer product for application to or consumption by the human body, said product comprising (a) a topically administrable or orally ingestible vehicle and one or more of the following: a flavorant, colorant, odorant, surfactant or antiseptic, and (b) a compound capable of stimulating the cold receptors of the nervous system in the surface tissues of the body when brought into contact therewith, the improvement which comprises using as the cold receptor stimulating compound an effective amount of a cold receptor stimulating urea of the formula:



wherein R_1 is H, C_1–C_7 alkyl or C_3–C_6 cycloalkyl;

R_2 is C_3–C_8 alkyl or C_3–C_8 cycloalkyl, alkylcycloalkyl, cycloalkylalkyl or alkylcycloalkylalkyl, with the proviso that when R_1 is H then R_2 is branched at an alpha carbon atom relative to the N atom, or at an alpha or beta carbon atom when R_1 is alkyl or cycloalkyl; and

R_5 and R_6 are each H, C_1–C_6 alkyl, C_3–C_6 alkylcycloalkyl, cycloalkyl or cycloalkylalkyl, C_2–C_8hydroxyalkyl, C_2–C_8 carboxyalkyl or C_3–C_8 alkylcarboxyalkyl;

R_1, R_2, R_5 and R_6 together providing a total of from 7–16 carbon atoms.

4,044,121

HAIR SPRAY CONTAINING FLUOROCARBON COMPOUNDS AS ADDITIVES

Su Sen Ko, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Mar. 11, 1976, Ser. No. 665,922

Int. Cl.[2] A61K *7/11*

U.S. Cl. 424—71 **14 Claims**

1. In a hair spray composition comprising a non-fluorinated film-forming resin in a solvent vehicle, the improvement comprising the addition to said composition of 0.005 to 5.0 percent by weight of said composition of a vehicle-soluble, dermally non-irritating compound of the formula:

$$R_fQ(XCO)A(COOZ)$$

wherein R_f is a monovalent, fluorinated, saturated, aliphatic radical having 3 to 20 carbon atoms and at least one terminal perfluorinated carbon atoms;

Q is a divalent linking group free of reactive groups which would chemically interfere with the formation of ester or amide linkages and free of heteroatoms other than sulfur, oxygen or nitrogen;

X is —O— or —NR— where R is hydrogen or alkyl having 1 to 14 carbon atoms;

A is phenylene containing only hydrogen substituents on the aromatic carbon atoms, or phenylene where one or more of said hydrogen substituents have been replaced by bromine, chlorine, alkyl having 1 to 4 carbon atoms, nitro, alkoxy having 1 to 4 carbon atoms, or combinations thereof;

Z is hydrogen or a cation selected from the group consisting of NH_4^+, Na^+, K^+, Li^+, a protonated alkyl amine, a protonated alkanol amine having 1 to 6 carbon atoms and quaternized forms of said amines

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4,044,122

METHOD OF TREATING HERPES VIRUS HOMINIS INFECTIONS

S. Harvey Sklar, 647 Anderson Ave., Cliffside Park, N.J. 07010

Filed Jan. 27, 1976, Ser. No. 652,656

Int. Cl.[2] A61K *31/70*

U.S. Cl. 424—180 **17 Claims**

1. A method of treating herpes virus hominis infection in a mammal afflicted with said infection which comprises administering to said mammal an effective amount for treating herpes virus hominis of the sodium salt of adenylic acid.

4,044,123

6'-N-ALKYL-4,6-DI-O-(AMINOGLYCOSYL)-1,3-DIAMINOCYCLITOLS, METHODS FOR THEIR USE AS ANTIBACTERIAL AGENTS AND COMPOSITIONS USEFUL THEREFOR

Peter J. L. Daniels, Cedar Grove, and William N. Turner, Bloomfield, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 574,070, May 2, 1975, abandoned. This application Mar. 15, 1976, Ser. No. 666,715

Int. Cl.[2] A61K *31/71*; C07H *15/22*

U.S. Cl. 424—180 **15 Claims**

14. The method of eliciting an antibacterial response in a warm-blooded animal having a susceptible bacterial infection, which comprises administering to said animal a non-toxic, antibacterially effective amount of a member selected from the group consisting of a 6'-N-alkylaminoglycoside derivative selected from the group consisting of

6'-N-X-sisomicin,
6'-N-X-Antibiotic 66-40B,
6'-N-X-Antibiotic 66-40D,
6'-N-X-Antibiotic Mu-1,
6'-N-X-Antibiotic Mu-2,
6'-N-X-Antibiotic Mu-4,
6'-N-X-Antibiotic Mu-5, and

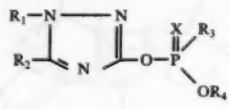
the 5-epi-, 5-epi-amino-5-deoxy-, and the 5-epi-azido-5-deoxy- analogs of the following:
6'-N-X-gentamicin C_{1a}
6'-N-X-gentamicin B,
6'-N-X-Antibiotic JI-20A,
6'-N-X-Antibiotic 66-40B,
6'-N-X-Antibiotic 66-40D, and
6'-N-X-sisomicin,
wherein X is a substituent selected from the group consisting of alkyl, cycloalkylalkyl, alkenyl, hydroxyalkyl, aminoalkyl, alkylaminoalkyl, aminohydroxyalkyl and alkylaminohydroxyalkyl, said substituent having two to eight carbon atoms, the carbon in said substituent adjacent to the aminoglycoside nitrogen being primary or secondary and unsubstituted by hydroxyl or amino functions, and when said substituent is substituted by both hydroxyl and amino functions only one of said functions can be attached at any one carbon atom;
and the pharmaceutically acceptable acid addition salts thereof.

4,044,124
TRIAZOLYLPHOSPHORUS COMPOUNDS

Beat Boehner, Binningen; Dag Dawes, Pratteln, and Willy Meyer, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 572,785, April 29, 1975, abandoned, which is a continuation of Ser. No. 310,726, Nov. 30, 1972, abandoned. This application Sept. 18, 1975, Ser. No. 614,733
Claims priority, application Switzerland, Dec. 10, 1971, 18064/71; Sept. 29, 1972, 14252/72
The portion of the term of this patent subsequent to Feb. 18, 1992, has been disclaimed.
Int. Cl.[2] C07D *249/12;* A01N *9/36*
U.S. Cl. 424—200 6 Claims

1. A compound of the formula



wherein
R_1 represents C_1–C_5-alkyl, cyclopentyl, cyclohexyl or unsubstituted phenyl,
R_2 represents C_1–C_5-alkoxy or phenoxy,
R_3 represents C_1–C_5-alkyl, C_1–C_5-alkoxy or C_1–C_5-alkylthio,
R_4 represents C_1–C_5-alkyl and
X represents oxygen or sulfur.

5. An insecticidal and acraicidal composition which contains as active component an insecticidally and acaricidally effective amount of a compound according to claim 1, together with a suitable inert carrier therefor.

4,044,125
METHOD OF STABILIZING ACETYLSALICYLIC ACID IN THE PRESENCE OF d-PROPOXYPHENE HYDROCHLORIDE AND COMPOSITIONS THEREOF

Walter D. Walkling, Huntingdon Valley, Pa., assignor to Eli Lilly and Company, Indianapolis, Ind.

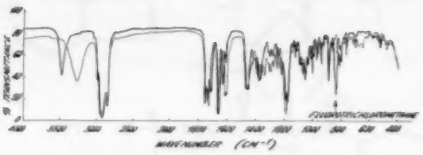
Continuation-in-part of Ser. No. 597,130, July 18, 1975, abandoned, which is a division of Ser. No. 177,870, Sept. 3, 1971, abandoned, which is a continuation-in-part of Ser. No. 72,504, Sept. 15, 1970, abandoned. This application Mar. 22, 1976, Ser. No. 669,059
Int. Cl.[2] A61K *31/61, 31/615, 31/625*
U.S. Cl. 424—232 5 Claims

1. The method of inhibiting the hydrolysis of acetylsalicylic acid in a pharmaceutical composition comprising actylsalicylic acid and d-propoxyphene hydrochloride which comprises incorporating glutamic acid hydrochloride into such pharmaceutical composition in an amount of from about 5 to about 130 percent by weight of d-propoxyphene hydrochloride in such pharmaceutical composition.

4,044,126
STEROIDAL AEROSOL COMPOSITIONS AND PROCESS FOR THE PREPARATION THEREOF

Peter Barry Cook, Standon, and John Harold Hunt, Theydon Bois, both of England, assignors to Allen & Hanburys Limited, London, England

Continuation of Ser. No. 352,187, April 18, 1973, abandoned. This application July 9, 1976, Ser. No. 703,821
Claims priority, application United Kingdom, Apr. 20, 1972, 18421/72
Int. Cl.[2] A61K *31/56*
U.S. Cl. 424—243 16 Claims



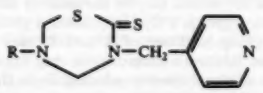
1. A method of converting an anti-inflammatory steroid selected from the group consisting of pregn-4-en-3,20-diones having at the 17α-position a hydroxy or acyloxy group, provided that when the 17α-position is substituted by a hydroxy group, the 21-position is substituted by an acyloxy group, or having a 16,17-ketonide group; having an axo group or a β-chlorine or β -hydroxy group at the 11-position; and having a single or double bond in the 1,2-position, the 21-position being unsubstituted or substituted by a hydroxy or acyloxy group or a halogen atom, said steroid having a hydrogen, fluorine or chlorine atom or a methyl group in the 6α-position; a hydrogen or chlorine atom in the 9α-position when there is a β-chlorine atom in the 11-position; a fluorine, chlorine or hydrogen atom in the 9α-position when there is an oxygen function at the 11-position; and a hydrogen atom or a methyl or methylene group at the 16-position; said steroid exhibiting crystal growth in aerosol propellants into a form which does not exhibit such growth whereby the said steroid is contacted with a halogenated hydrocarbon to form a crystalline solvate therewith, the crystalline material so formed being, if desired after removal of some or all of the halogenated hydrocarbon therefrom, reduced to a particle size permitting inhalation into the human bronchial system when dispersed as an aerosol.

4,044,127
PROCESS FOR UTILIZING TETRAHYDRO-3-(4-PYRIDYLMETHYL)-2H-1,3,5-THIADIAZINE-2-THIONES AS FUNGICIDAL AGENTS

Thomas Andrew Lies, Montgomery Township, Somerset County, and Herman Berenson, Trenton, both of N.J., assignors to American Cyanamide Company, Stamford, Conn.

Division of Ser. No. 665,656, March 10, 1976. This application Sept. 23, 1976, Ser. No. 725,754
Int. Cl.[2] A01N *9/12*
U.S. Cl. 424—246 10 Claims

1. A method for the protection of plants from fungi comprising applying to said plants a fungicidally effective amount of the compound of the formula:



wherein R is selected from the group consisting of methyl, ethyl, isopropyl, n-butyl, tert-butyl, n-dodecyl, β-hydroxyethyl, carboxymethyl, carboxamidomethyl, o-tolyl and 4-chloro-o-tolyl.

4,044,128

INSECTICIDAL SULFONIUM SALTS

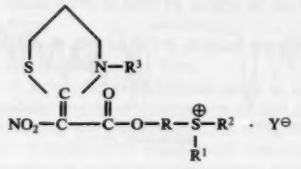
Steven A. Roman, Oakdale, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 582,578, June 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 468,125, May 8, 1974, abandoned. This application June 10, 1976, Ser. No. 694,748

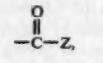
Int. Cl.[2] C07D *279/04;* **A01N** *9/12*

U.S. Cl. 424—246 **5 Claims**

1. A sulfonium salt of the formula:



wherein Y is an anion selected from chloride, bromide, iodide, methyl sulfate, fluorosulfonyl and fluoborate, R is —CH_2—CH_2—or such in which one of the hydrogen atoms has been replaced by methyl, R^1 is alkyl of 1 to 3 carbon atoms, R^2 contains up to twenty carbon atoms and is alkyl or alkenyl or is phenyl, benzyl or phenethyl, and R^3 is hydrogen or



wherein Z is —R^4, —OR^4 or —SR^4, R^4 being one of the moieties represented by R^2.

4. A method for controlling insects which comprises contacting them with an insecticidally effective amount of a salt of claim 1.

4,044,129

4-PYRIDINE CARBONYL PHENYL 1,2,4 TRIAZOLES

Yutaka Kuwada, Ashiya; Kanji Meguro, Takarazuka; Hideaki Natsugari, Nishinomiya; Yoshiaki Sato, Kobe, and Hiroyuki Tawada, Takatsuki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

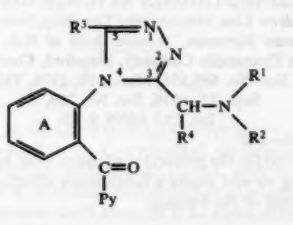
Filed July 3, 1975, Ser. No. 592,889

Claims priority, application Japan, July 25, 1974, 49-85787

Int. Cl.[2] C07D *413/14;* **A61K** *31/535*

U.S. Cl. 424—248.56 **25 Claims**

1. A compound of the formula



wherein R^1 and R^2, which may be the same or different, represent a C_1-C_6 alkyl group, a C_3-C_6 cycloalkyl group or a benzyl or phenethyl group, and one of R^1 and R^2 may be hydrogen atoms or R^1 and R^2 form a heterocyclic ring together with the nitrogen atom adjacent thereto selected from the group consisting of pyrrolidine, piperidine, piperazine, morpholine and N-substituted piperazines selected from the group consisting of N—C_1—C_2 alkyl piperazines, N-(2-hydroxy ethyl)piperazine and homopiperidine; R^3 represents hydrogen, a C_1-C_6 alkyl group, a C_3-C_6 cycloalkyl group, a benzyl or phenthyl group or an aryl group selected from the group consisting of phenyl, tolyl and naphthyl; R^4 represents hydrogen or a C_1-C_4 alkyl group; Py represents a pyridyl group and the ring A is either unsubstituted or substituted by a halogen, nitro, a C_1-C_4 alkyl group, a C_1-C_4 alkoxy group or a trilfluoromethyl group or a pharmaceutically acceptable acid addition salt thereof.

25. A pharmaceutical compound having central nervous system activity comprising a therapeutically effective amount of a compound selected from the group consisting of a compound as claimed in claim 1 or a pharmaceuticaly acceptable acid addition salt thereof together with a pharmaceutically acceptable carrier or diluent therefor.

4,044,130

COMPOSITIONS FOR THE CONTROL OF MICROORGANISMS

Graham Arton Howarth, Knutsford, and James Gainer, Tyldesley, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

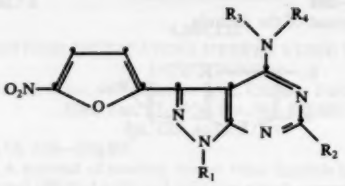
Division of Ser. No. 485,472, July 3, 1974, Pat. No. 3,948,913, which is a continuation-in-part of Ser. No. 247,284, April 25, 1972, abandoned. This application Dec. 17, 1975, Ser. No. 641,479

Int. Cl.[2] A61K *31/04, 31/415*

U.S. Cl. 424—248.56 **3 Claims**

1. A composition for the control of microorganisms harmful to domestic mammals or organic materials comprising an effective amount of a compound of formula I

(I)



wherein

R_1 represents alkyl of 1 to 3 carbon atoms,

R_2 represents a hydrogen atom or alkyl of 1 to 3 carbon atoms, and

R_3 represents a hydrogen atom, alkyl or hydroxy-alkyl of 1 to 3 carbon atoms, alkoxyalkyl wherein the alkoxy and alkyl moieties may each have from 1 to 3 carbon atoms or a hydroxy group, while

R_4 has the meaning given above for R_3 except that it may not represent a hydroxy group, or R_3 and R_4 together represent pyrrolidine, morpholine, piperidine or azepine,

as well as the 5-n-oxides of said compounds and/or pharmaceutically acceptable acid addition salts thereof and an inert carrier material.

4,044,131

2-MORPHOLINOL DERIVATIVES

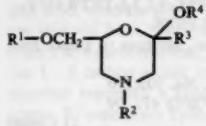
Andre A. Asselin, Ville le Moyne, and Leslie G. Humber, Dollard des Ormeaux, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Nov. 24, 1975, Ser. No. 634,685

Int. Cl.[2] C07D *265/32;* **A61K** *31/535*

U.S. Cl. 424—248.58 **8 Claims**

1. A compound of formula I



(I)

in which R^1 is 1-naphthalenyl; R^2 is selected from the group consisting of lower alkyl and lower alkynyl; R^3 is selected from the group consisting of hydrogen, lower alkyl, phenyl and phenyl substituted with a halo; and R^4 is selected from the group consisting of hydrogen and lower alkyl; or therapeutically acceptable salt thereof.

6. A β-adrenergic or anti-fungal composition comprising an effective amount of a compound of formula I, or a therapeutically acceptable salt thereof as defined in claim **1**, and a pharmaceutically acceptable carrier.

4,044,132

SUBSTITUTED PIPERAZINE DERIVATIVE, ITS PREPARATION AND ANOREXIA COMPOSITIONS CONTAINING IT

Henry Najer; Regis Dupont, both of Paris, and Don Pierre René Lucien Giudicelli, Fontenay sous Bois, all of France, assignors to Synthelabo, Paris, France

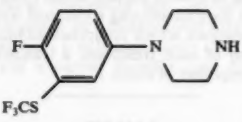
Filed Mar. 11, 1976, Ser. No. 665,884

Claims priority, application France, Mar. 12, 1975, 75.07650

Int. Cl.[2] A61K *31/495;* **C07D** *295/06*

U.S. Cl. 424—250 **4 Claims**

1. 1-(4-Fluoro-3-trifluoromethylthio-phenyl)piperazine of the formula



or a pharmaceutically acceptable acid addition salt thereof.

3. An anorexigenic composition comprising a dosage unit form containing 1 to 50 mg of the compound of claim **1** in association with a pharmaceutically compatible carrier or excipient.

4. A method of inducing anorexia in a patient which comprises administering to said patient 1-(4-fluoro-3-trifluoromethylthio-phenyl)piperazine or a pharmaceutically acceptable salt thereof in an amount sufficient to induce anorexia.

4,044,133

ANTICOCCIDIAL COMPOSITIONS

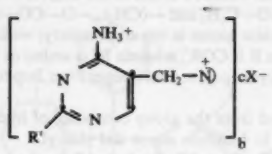
Edward F. Rogers, Middletown; John Hannah, Matawan, both of N.J., and Richard A. Dybas, Center Square, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 462,063, April 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 224,620, Feb. 8, 1972, abandoned. This application Oct. 16, 1975, Ser. No. 623,183

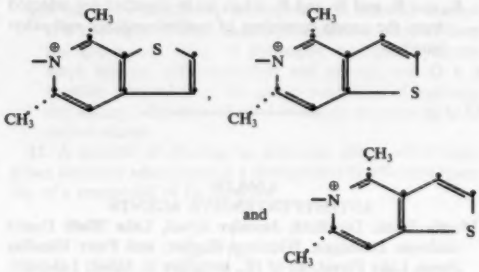
Int. Cl.[2] A61K *31/505*

U.S. Cl. 424—251 **9 Claims**

1. A feed supplement composition useful as a coccidiostat comprising a solid, orally ingestible carrier and a compound of the formula:



wherein R' is alkyl having 1 to 3 carbon atoms; X^- is a non-toxic anion; b and c are integers such that the positive charge of *b* moles of cation are neutralized by c moles of anion X^-; and $-\overset{+}{N}-$ is a member of the group consisting of:



wherein the dotted line indicates that the alpha methyl group can be present or a hydrogen group can be present, with the proviso that one and only one methyl group is present and wherein said compound is from 2 to 25% by weight of said feed supplement composition.

4,044,134

FUSED PYRIMIDIN-4(3H)-ONES AS ANTIALLERGY AGENTS

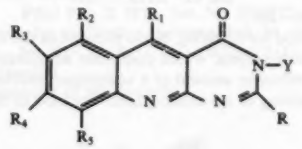
Thomas H. Althuis, Groton; Leonard J. Czuba, New London; Hans-Jurgen E. Hess, Old Lyme, and Saul B. Kadin, New London, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 485,945, July 5, 1974, Pat. No. 3,974,161, which is a continuation-in-part of Ser. No. 444,138, Feb. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 351,025, April 13, 1973, abandoned. This application Mar. 16, 1976, Ser. No. 667,515

Int. Cl.[2] A61K *31/505*

U.S. Cl. 424—251 **17 Claims**

1. The method of controlling allergic symptoms in a mammalian subject which comprises administering to the subject an allergy symptom-controlling amount of a compound selected from the group consisting of those having the formula



and the pharmaceutically acceptable cation salts thereof wherein R is selected from the group consisting of methyl, ethyl, acetyl and COR^* wherein

R^* is selected from the group consisting of hydroxy, alkoxy having 1 to 4 carbon atoms, hydroxyalkoxy having 2 to 4 carbon atoms, amino and hydroxyamino;

Y is selected from the group consisting of (a) hydrogen and (b) alkyl having 1 to 4 carbon atoms, carbalkoxyalkyl having 2 to 5 carbon atoms in the carbalkoxy moiety and 1 to 4 carbon atoms in the alkyl moiety, carboxyalkyl

having 1 to 4 carbon atoms in the alkyl moiety, $-(CH_2)_m-O-CO-C_6H_5$ and $-(CH_2)_m-O-CO-$alkyl having 1 to 4 carbon atoms in the alkyl moiety; with the proviso that when R is COR° wherein R° is amino or hydroxyamino, Y is hydrogen; m is an integer from 2 up to and including 4;

R_1 is selected from the group consisting of hydrogen, alkyl having 1 to 4 carbon atoms and phenyl;

each of R_2, R_3, R_4 and R_5 is selected from the group consisting of hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, halo, benzyloxy, hydroxy, thiol, alkanoyloxy having 1 to 4 carbon atoms, benzylthio, benzoyloxy, benzylsulfinyl, methylthio and methylsulfinyl and

R_2 and R_3 and R_3 and R_4 when taken together are selected from the group consisting of methylenedioxy and ethylenedioxy.

4,044,135

ANTIHYPERTENSIVE AGENTS

Martin Winn, Deerfield; Jaroslav Kyncl, Lake Bluff; Daniel Ambrose Dunnigan, Winthrop Harbor, and Peter Handley Jones, Lake Forest, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 14, 1975, Ser. No. 621,979

Int. Cl.² C07D *239/84;* A61K *31/505*

U.S. Cl. 424—251 **6 Claims**

1. The compound comprising 2[4-(tetrahydro-2-furoyl)-hexahydro-1,4-diazepinyl-1]-4-amino-6,7-dimethoxy quinazoline and pharmaceutically acceptable salts thereof.

5. The method of treating hypertension in mammals comprising administering to said mammals a therapeutically effective amount of a compound of claim **1.**

4,044,136

AMINOQUINAZOLINE THERAPEUTIC AGENTS

John Christopher Danilewicz, Ash; John Edward Glyn Kemp, Canterbury, and James Robert Wright, Deal, all of England, assignors to Pfizer Inc., New York, N.Y.

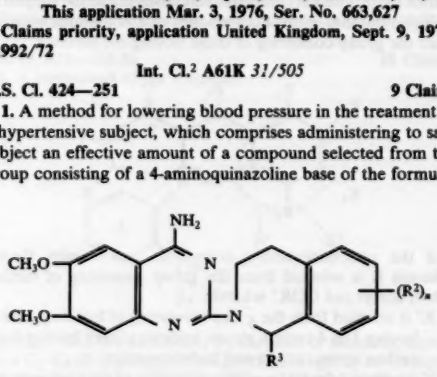
Division of Ser. No. 394,491, Sept. 5, 1973, Pat. No. 3,960,861. This application Mar. 3, 1976, Ser. No. 663,627

Claims priority, application United Kingdom, Sept. 9, 1972, 41992/72

Int. Cl.² A61K *31/505*

U.S. Cl. 424—251 **9 Claims**

1. A method for lowering blood pressure in the treatment of a hypertensive subject, which comprises administering to said subject an effective amount of a compound selected from the group consisting of a 4-aminoquinazoline base of the formula



and a pharmaceutically-acceptable acid addition salt thereof, wherein $(R^2)_n$ represents 6,7-di-lower alkoxy, 7,8-di-lower alkoxy or 6-methoxy-7-allyloxy and R_3 is hydrogen or methyl.

4,044,137

2-(PHENYLTHIOPROPYL)-5-ARYL-1,2,3,4-TETRAHYDRO-γ-CARBOLINES

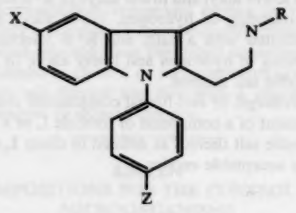
Willard M. Welch, Jr., Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed July 7, 1976, Ser. No. 703,175

Int. Cl.² A61K *31/44;* C07D *471/04*

U.S. Cl. 424—256 **11 Claims**

1. A compound selected from those of the formula:

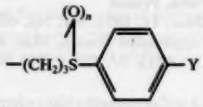


and the pharmaceutically acceptable acid addition salts thereof, wherein

X is selected from the group consisting of fluoro, chloro, bromo and hydrogen;

Z is selected from the group consisting of hydrogen, fluoro, chloro and methoxy; and

R is



wherein *n* is an integer of 0 or 1 and Y is selected from the group consisting of fluoro, chloro, methyl and hydrogen.

10. A method for tranquilizing a mammal displaying schizophrenic manifestations which comprises administering to said mammal in need of such treatment, a tranquilizing effective amount of a compound of claim **1.**

4,044,138

PHARMACEUTICAL COMPOSITIONS CONTAINING 5,6,7,8-TETRAHYDROQUINOLINE DERIVATIVES AND RELATED COMPOUNDS

Adrian Charles Ward Curran, South Cave; Roger Crossley, Reading, and David George Hill, Cookham, all of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

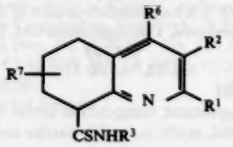
Continuation-in-part of Ser. No. 600,257, July 30, 1975, which is a continuation-in-part of Ser. No. 460,265, April 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 403,289, Oct. 3, 1973, abandoned. This application Oct. 24, 1975, Ser. No. 625,431

Claims priority, application United Kingdom, Oct. 21, 1972, 48595/72; Oct. 15, 1973, 7424/73; July 21, 1973, 34866/73; Aug. 16, 1973, 38701/73; Oct. 17, 1973, 48595/72

Int. Cl.² A61K *31/47*

U.S. Cl. 424—258 **14 Claims**

1. An anti-ulcer pharmaceutical composition comprising an effective amount of a compound of formula I



or an acid addition salt thereof with a pharmaceutically acceptable acid, wherein R^1, R^2 and R^6 are the same or different and are selected from hydrogen, trifluoromethyl, alkyl containing from 1 to 6 carbon atoms, phenylalkyl wherein the alkyl group has 1 - 6 carbon atoms, or phenyl groups or R^1 and R^2 taken together represent a polymethylene chain of 3 to 5 carbon atoms, R^7 represents hydrogen or from 1 to 3 groups selected from alkyl of 1 to 6 carbon atoms which may be substituted by alkoxy of 1 to 6 carbon atoms or trifluoromethyl, phenylalkyl wherein the alkyl group has 1 to 6 carbon atoms and phenyl groups, R^3 is hydrogen or alkyl of 1 to 6 carbon atoms, and any of the phenyl or the phenyl portion of any phenylalkyl groups R^1, R^2, R^6 and R^7 may be substituted by alkyl of 1 to 6 carbon atoms, lower alkoxy of 1 to 6 carbon atoms, halogen, nitro or trifluoromethyl with the provisos that (1) when R^1 and R^2 or R^2 and R^6 are both alkyl they are selected from normal and secondary alkyl groups and (2) when two alkyl R^7 groups are present on the same carbon atom then they are both n-alkyl groups and when two R^7 alkyl groups are present on adjacent carbon atoms they are selected from normal and secondary alkyl groups and a pharmaceutically acceptable carrier.

4,044,139
BIS(DIPHENYLAMINOMETHANE) ANTIMICROBIAL AGENTS

Bogislav von Schmeling, Hamden, Conn., and Walter R. Boos, Guelph, Canada, assignors to Uniroyal, Inc., New York, N.Y. and Uniroyal Ltd., Canada

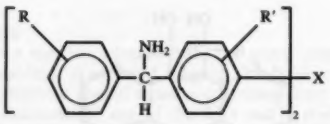
Division of Ser. No. 440,941, Feb. 8, 1974, Pat. No. 3,954,868, which is a division of Ser. No. 231,385, March 2, 1972, Pat. No. 3,808,316. This application Feb. 13, 1976, Ser. No. 658,004

Int. Cl.[2] A61K *31/44;* **C07D** *213/36*

U.S. Cl. 424—263 **10 Claims**

6. A composition for the control of bacteria or fungi comprising a chemical containing two dephenylaminomethane groups, linked together by a moiety other than oxygen, having the following formula I, in bactericidally or fungicidally effective amount, and a carrier therefor, said formula being as follows:

I



wherein X is furyl fused to one phenyl group of each diphenylaminomethane moiety, and R and R′ are the same or different and are selected from the group consisting of hydrogen, methyl, methoxy, and phenoxy.

7. A composition for the control of bacteria or fungi, comprising 1,4-bis(4-phenoxy-alpha-aminobenzyl)benzene, in bactericidally or fungicidally effective amount, and a carrier therefor.

4,044,140
TRITYL PICOLINIC ACID DERIVATIVES AND THEIR USE AS ANTI-ACNE AGENTS

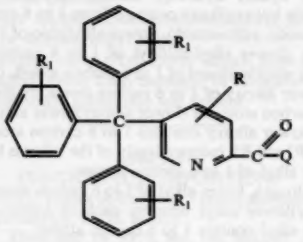
Margaret H. Sherlock, Bloomfield, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Filed Nov. 28, 1975, Ser. No. 636,010

Int. Cl.[2] A61K *31/455;* **C07D** *213/44*

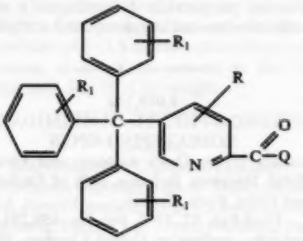
U.S. Cl. 424—266 **16 Claims**

1. A compound of the formula:



and the pharmaceutically acceptable salts thereof, wherein R is hydrogen or alkyl; each R_1 is a member selected from the group consisting of hydrogen, halogen, hydroxy, alkyl, alkoxy, trifluoromethyl and phenyl; and Q is a member selected from the group consisting of hydroxy, and alkoxy, wherein said alkyl or alkoxy contains up to 12 carbon atoms.

12. A method of eliciting an anti-acne effect which comprises topically administering a therapeutically effective quantity of a compound of the formula:



and the pharmaceutically acceptable salts thereof, wherein R is hydrogen or alkyl; each R_1 is a member selected from the group consisting of hydrogen, halogen, hydroxy, alkyl, alkoxy, trifluoromethyl and phenyl; and Q is a member selected from the group consisting of hydroxy, and alkoxy, wherein said alkyl or alkoxy contains up to 12 carbon atoms.

4,044,141
1,4-DIHYDROPYRIDINES

Friedrich Bossert, Wuppertal; Egbert Wehinger, Neviges; Kurt Stoepel, Wuppertal; Wulf Vater, Leverkusen, and Stanislav Kazda, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

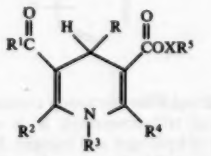
Filed Feb. 2, 1976, Ser. No. 654,278

Claims priority, application Germany, Feb. 26, 1975, 2508181

Int. Cl.[2] A61K *31/455;* **C07D** *213/55*

U.S. Cl. 424—266 **22 Claims**

1. A compound of the formula:



wherein

is a phenyl group, unsubstituted or substituted with from one to three sterically permissible substituents selected from the group consisting of lower alkyl of 1 to 6 carbon atoms,

alkoxy of 1 to 6 carbon atoms, halo, trifluoromethyl, nitro, azido, cyano, hydroxy, amino, carbo(lower alkoxy) wherein lower alkoxy contains from 1 to 6 carbon atoms, carbamido, sulfonamido, (lower alkyl)thio of 1 to 6 carbon atoms, (lower alkyl)sulfinyl of 1 to 6 carbon atoms o. (lower alkyl)sulfonyl of 1 to 6 carbon atoms, or naphthyl,

R^1 is lower alkoxy of 1 to 6 carbon atoms, cycloalkoxy of 3 to 7 carbon atoms or (lower alkoxy)lower alkoxy wherein each lower alkoxy contains 1 to 6 carbon atoms;

each of R^2 and R^4, independently of the other is hydrogen or lower alkyl of 1 to 6 carbon atoms;

R^3 is hydrogen, lower alkyl of 1 to 6 carbon atoms or (lower alkoxy)lower alkyl wherein each of lower alkoxy and lower alkyl contain 1 to 6 carbon atoms;

R^5 is a phenyl, phenoxy or phenylthio group unsubstituted or substituted with from one to three sterically permissible substituents selected from the group consisting of lower alkyl of 1 to 6 carbon atoms, lower alkoxy of 1 to 6 carbon atoms, halo, trifluoromethyl, hydroxy, amino, di(lower alkyl)amino wherein each lower alkyl contains 1 to 6 carbon atoms, nitro, cyano, carbamido, sulfonamido, (lower alkyl)thio of 1 to 6 carbon atoms, (lower alkyl)sulfinyl of 1 to 6 carbon atoms, a (lower alkyl) sulfonyl of 1 to 6 carbon atoms; and

X is lower alkylene of 1 to 6 carbon atoms.

21. The method of producing coronary dilating, spasmolytic and hypotensive effects in humans and other animals which comprises orally, parenterally or perlingually administering thereto an effective amount of a compound according to claim **1.**

4,044,142

1,2-DIHYDRO-6-PHENYL-1H,4H-IMIDAZOBENZODIAZEPIN-1-ONES

John Bodenham Taylor, Down Ampney, near Cirencester, and Derek Ralph Harrison, Swindon, both of England, assignors to Roussel Uclaf, Paris, France

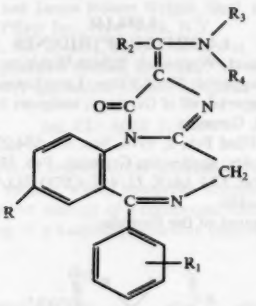
Filed Feb. 17, 1976, Ser. No. 658,301

Claims priority, application United Kingdom, Feb. 15, 1975, 6509/75; Nov. 4, 1975, 4580/75

Int. Cl.² C07D *403/14*

U.S. Cl. 424—250 **21 Claims**

1. A compound selected from the group consisting of 1,2-dihydro-6-phenyl-1H,4H-imidazo-benzodiazepin-1-ones of the formula



wherein R is selected from the group consisting of hydrogen, halogen, nitro and trifluoromethyl, R_1 is selected from the group consisting of hydrogen and halogen, R_2 is selected from the group consisting of hydrogen and methyl and R_3 and R_4 taken together with the nitrogen atom to which they are attached from a piperazinyl optionally substituted with at least one member of the group consisting of alkyl of 1 to 5 carbon atoms, hydroxyalkyl of 1 to 5 carbon atoms, hydroxyalkyl of 1 to 5 carbon atoms, dialkylphosphinylalkyl with 1 to 5 carbon atoms in the alkyl groups, cycloalkylalkyl with 3 to 6 carbon atoms in the ring and 1 to 5 alkyl carbon atoms, alkenyl of 2 to 5 carbon atoms and phenyl and their non-toxic, pharmaceutically acceptable acid addition salts.

4,044,143

10,11-BIS-(HYDROXYALKYL) DERIVATIVES OF CYPROHEPTADINE

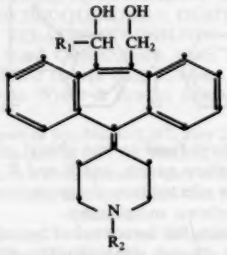
David C. Remy, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 545,646, Jan. 30, 1975, Pat. No. 3,974,285. This application Mar. 3, 1976, Ser. No. 663,187

Int. Cl.² C07D *211/70*

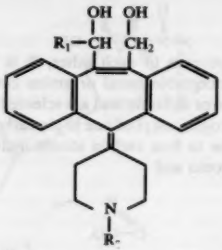
U.S. Cl. 424—267 **12 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen or lower alkyl having from one to five carbon atoms and R_2 is lower alkyl having from one to five carbon atoms, and the nontoxic pharmaceutically acceptable salts thereof.

9. A method of producing an anticholinergic effect comprising administering a therapeutically effective amount in unitary dosage form of a compound having the structure:



or a nontoxic pharmaceutically acceptable acid addition salt thereof.

4,044,144

1H-TETRAZOLE-5-CARBOXAMIDES

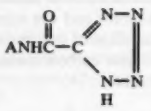
John H. Sellstedt, Pottstown; Charles J. Guinosso, King of Prussia, both of Pa., and Albert J. Begany, Tucson, Ariz., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 542,465, Jan. 20, 1975, Pat. No. 3,966,965, which is a continuation-in-part of Ser. No. 344,466, March 23, 1973, abandoned. This application Mar. 23, 1976, Ser. No. 669,562

Int. Cl.[2] A61K *31/41;* **C07D** *257/04*

U.S. Cl. 424—269 **9 Claims**

1. A process for preventing the release of pharmocological mediators from an immediate hypersensitivity reaction between reaginic type antibodies and an antigen, thereby preventing the symptoms manifest in bronchial asthma, seasonal pollinosis, allergic rhinitis, urticaria, allergic conjunctivitis, food allergy and anaphylactoid reactions of a sensitized animal, which comprises prophylactically administering to said animal an effective amount of a compound of the formula:

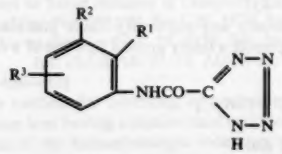


in which

A is a member selected from the group consisting of α-naphthyl, β-naphthyl, phenyl, 2,6-dichlorophenyl, and substituted phenyl moieties containing from one to three substituents in any of the 2,3,4 and 5 positions of the phenyl ring, independently selected from the group consisting of lower alkyl, lower alkylsulfinyl, lower alkoxy, hydroxy(lower) alkoxy, 2-(lower alkoxy oxalyloxy)ethoxy, N-mono- and di-lower alkylamino(lower)alkoxy, halo, sulfamyl, polyhalo(lower)alkyl, carbamoyl, N-lower alkylcarbamoyl, mono- and di-lower alkylamino, carboxy, lower alkylcarbonyl, cyano, carb(lower)alkoxy, phenoxy(lower)alkoxy, lower alkoxy-oxalamido and lower alkoxyoxalamidophenoxy radicals;

of a pharmaceutically acceptable salt thereof.

2. The process of claim **1** which comprises administering to said sensitive animal a compound of the formula



in which

R^1 is —CN or $CONH_2$;

R^2 is lower alkoxy, hydroxy(lower)alkoxy, lower alkylamino or di(lower)alkyl amino;

R^3 is hydrogen, lower alkyl, lower alkoxy, halo, poly-halo(lower)alkyl, lower alkyl carbonyl or carb(lower) alkoxy;

or pharmaceutically acceptable salt thereof.

4,044,145

FUNGICIDAL COMPOSITIONS

Laurent Lacroix, Villers St-Fargeau, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed July 14, 1975, Ser. No. 595,605

Claims priority, application France, July 15, 1974, 74.24511; June 4, 1975, 75.17425

Int. Cl.[2] A01N *9/02, 9/12, 9/22*

U.S. Cl. 424—273 R **7 Claims**

1. A fungicidal composition which comprises a combination of 1-isopropylcarbamoyl-3-(3,5-dichlorophenyl)hydantoin and another fungicide selected from the class consisting of 2-methoxycarbonylamino-benzimidazole, 1-butyl-carbamoyl-2-methoxycarbonylamino-benzimidazole, and 1,2-bis-(3-methoxycarbonylthioureido)benzene, in association with one or more diluents or adjuvants compatible with the fungicides and suitable for use in agricultural fungicidal compositions, the amount of fungicide in the composition being between 0.005% and 80% by weight of the composition, and the percentage of 1-isopropylcarbamoyl-3-(3,5-dichlorophenyl)hydantoin in the said combination of fungicides present in the composition being between 10% and 90% by weight.

4,044,146

XANTHENE-9-CARBOXYLATES

Egon Karpáti; László Szporny, both of Budapest; Mihály Bartók, Szeged; József Czombos, Szeged; Károly Felföldi, Szeged; Márta Laszlavik, Szeged, and Ferenc Notheisz, Szeged, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar R.T., Budapest, Hungary

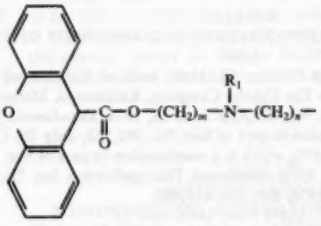
Continuation-in-part of Ser. No. 673,135, April 2, 1976. This application Jan. 21, 1977, Ser. No. 761,402

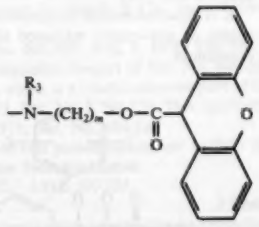
Claims priority, application Hungary, June 27, 1975, RI 569

Int. Cl.[2] C07D *311/84*

U.S. Cl. 424—283 **7 Claims**

1. A xanthene-9-carboxylate of the formula





wherein

R_1 and R_3 may be the same or different and each is lower alkyl,

n and *m* each represent integers of 2 to 5, or a pharmaceutically effective salt thereof.

4,044,147

N-(ACYL)-p-AMINO-N'-(MONOSUBSTITUTED)-BENZAMIDE ANTI-ULCER AGENTS

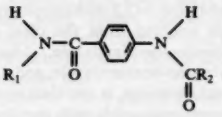
Albin J. Nelson, Ledyard, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed May 26, 1976, Ser. No. 690,300

Int. Cl.[2] A61K *31/24, 31/19;* **C07C** *101/44*

U.S. Cl. 424—309 **10 Claims**

1. A compound of the formula



wherein:

R_1 is selected from the group consisting of n-alkyl having from seven to eighteen carbon atoms, phenyl, benzyl and phenylethyl,

R_2 is selected from the group consisting of $-(CH_2)_nCO_2R_3$, $-(CHOR_4)_nCO_2R_3$ and

said Z substituent being $-(CH_2)_uCO_2R_3$,

R_3 is hydrogen or alkyl having from one to five carbon atoms,

R_4 is hydrogen or acetyl;

n is an integer from one to four;

u is 0 or an integer from one to two; and the alkali, alkaline earth and ammonium salts of those compounds having at least one carboxylate group.

4,044,148

COMPOUNDS, COMPOSITIONS AND METHODS OF USE

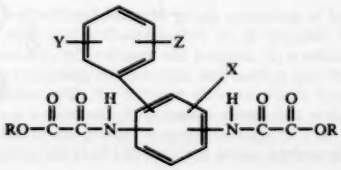
John B. Wright, and Charles M. Hall, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 477,818, June 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 382,762, July 26, 1973, Pat. No. 3,993,679, which is a continuation-in-part of Ser. No. 317,005, Dec. 20, 1972, abandoned. This application Jan. 22, 1976, Ser. No. 651,480

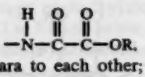
Int. Cl.[2] A01N *9/24;* **C07C** *101/447*

U.S. Cl. 424—317 **23 Claims**

1. A pharmaceutical composition which comprises an antireagin or non-reagin mediated allergy effective amount of a compound



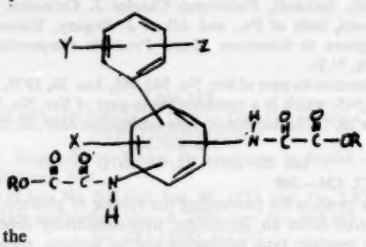
wherein the



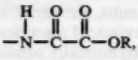
groups or meta or para to each other; R is hydrogen or a physiologically acceptable metal or amine cation; and X, Y, and Z are the same or different and are selected from the group consisting of hydrogen, alkyl of one to six carbon atoms, inclusive, alkoxy of one to four carbon atoms, inclusive, hydroxy, fluoro, chloro, bromo and

wherein D is selected from the group consisting of hydrogen, alkyl of one to six carbon atoms, inclusive, and a physiologically acceptable metal or amine cation, with the proviso that when D is hydrogen or a physiologically acceptable metal or amine cation, D is the same as R; in association with a pharmaceutical carrier.

9. Compounds of the structure



wherein the



groups are meta or para to each other; R is hydrogen or a physiologically acceptable metal or amine cation; and X, Y and Z are the same or different and are selected from the group consisting of hydrogen, alkyl of one to six carbon atoms, inclusive, alkoxy of one to four carbon atoms, inclusive, hydroxy, fluoro, chloro, bromo and

wherein D is selected from the group consisting of hydrogen, alkyl of one to six carbon atoms, inclusive, and a physiologically acceptable metal or amine cation, with the proviso that when D is hydrogen or a physiologically acceptable metal or amine cation, D is the same as R.

4,044,149

ALUMINUM SALTS OF SUBSTITUTED PHENYLALKANOIC ACIDS AND PHARMACEUTICAL SUSPENSIONS PREPARED THEREFROM

Calvin H. Fields, and Clarence A. Hirsch, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 469,257, May 13, 1974, Pat. No. 3,976,674, which is a continuation-in-part of Ser. No. 302,709, Nov. 1, 1972, abandoned. This application July 14, 1976, Ser. No. 705,225

Int. Cl.[2] A61K *31/19*

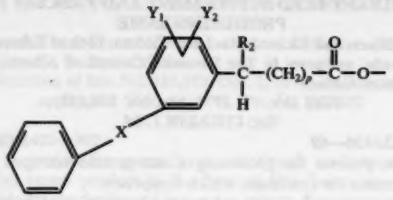
U.S. Cl. 424—317 **6 Claims**

1. A chemically and physically stable pharmaceutical suspension comprising a finely ground powder of a compound of the formula:

wherein

n is 1 or 2; and

R_1 is the moiety:



wherein:

p is 0, 1, 2 or 3;

X is oxygen or sulfur

R_2 is hydrogen, C_1–C_5 alkyl, C_2–C_5 alkenyl, C_2–C_5 alkynyl, or C_3–C_6 cycloalkyl; and

Y_1 and Y_2 are, independently, hydrogen, hydroxy, halo, C_1–C_3 alkyl, or C_1–C_3 alkoxy, but Y_2 is hydrogen when Y_1 is hydroxy or C_1–C_3 alkoxy

suspended in a vehicle comprising water, one of the parabens as a preservative, a specific gravity adjusting agent selected from the class consisting of fructose, dextrose, mannose, lactose, sucrose, glycerin, propylene glycol and mannitol, and a viscosity adjusting substance selected from the class consisting of methylcellulose, polyvinylpyrrolidone hydroxypropylcellulose, sodium carboxymethylcellulose, microcrystalline cellulose, finely ground bentonite, gelatin, guar gum, or a combination of two or more of such substances.

4,044,150

ANTIHYPERTENSIVE 4'-[1-HYDROXY-2-[(1-PHENOXYETHYL)-AMINO]ETHYL]METHANESULFONANILIDE AND SALTS THEREOF AND THERAPEUTIC USE

William E. Kreighbaum, and Herbert R. Roth, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed June 18, 1976, Ser. No. 697,508

Int. Cl.[2] A61K *31/18;* C07C *143/72, 143/84*

U.S. Cl. 424—321 **11 Claims**

1. A compound selected from the group consisting of 4'-[1-hydroxy-2-[(2-phenoxyethyl)amino]ethyl]methanesulfonanilide and the pharmaceutically acceptable acid addition and metal salts thereof.

5. An antihypertensive process which comprises systemically administering to a hypertensive mammal an effective antihypertensive amount of a compound selected from the group consisting of 4'-[1-hydroxy-2-[(2-phenoxyethyl)amino]ethyl]methanesulfonanilide and pharmaceutically acceptable acid addition and metal salts thereof.

9. A pharmaceutical dosage unit adapted for systemic administration to a hypertensive mammal comprising a pharmaceutical carrier and an effective antihypertensive amount of a compound selected from the group consisting of 4'-[1-hydroxy-2-[(2-phenoxyethyl)amino]ethyl]methanesulfonanilide and pharmaceutically acceptable acid addition and metal salts thereof.

4,044,151

SULFAMIDOPHENETHANOLAMINE THERAPEUTIC PROCESS

William T. Comer, and John D. Catt, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 399,024, Sept. 20, 1973, Pat. No. 3,923,886. This application Nov. 19, 1975, Ser. No. 633,537

Int. Cl.[2] A61K *31/18, 31/44, 31/445*

U.S. Cl. 424—321 **7 Claims**

1. The method for inhibiting beta-adrenergic activity in a mammalian host having a disease state resulting from excessive activation of the beta-adrenergic receptors which comprises administering to said host a non-toxic effective adrenergic beta-receptor inhibiting dose of a compound selected from a group consisting of

wherein:

R^1 is hydrogen, lower alkyl having from 1 to 4 carbon atoms cyclopropyl, phenyl, or tolyl;

R^2 is hydrogen, lower alkyl having from 1 to 4 carbon atoms, cyclopropyl or benzyl; or

R^1 and R^2 are joined to form with the nitrogen atoms to which they are attached the 1-piperidyl group;

R^3 is hydrogen, methyl, or ethyl; and

R^4 is hydrogen, cyclopropyl, or lower alkyl having from 1 to 4 carbon atoms,

and the pharmaceutically acceptable acid addition and metal salts thereof.

4,044,152

METHODS OF PREPARING METHYLROSANILINE CHLORIDE ANTI-MICROBIAL COMPOSITIONS

Dennis E. Jackson, Springfield, Mo., assignor to Naremco, Inc., Springfield, Mo.

Division of Ser. No. 538,905, Jan. 6, 1975, Pat. No. 3,965,266, which is a continuation of Ser. No. 307,372, Nov. 17, 1972, abandoned. This application Dec. 2, 1975, Ser. No. 637,042

Int. Cl.[2] A01N *9/20;* A61K *31/14*

U.S. Cl. 424—329 **7 Claims**

3. A method of preparing a methylrosaniline chloride-containing, anti-microbial composition from which methylrosaniline chloride is readily released in the presence of moisture, comprising dissolving methylrosaniline chloride in a vaporizable solvent, adding the resulting solution and a solution of a non-toxic acid to a finely-divided mineral carrier, the acid being one which does not form water insoluble reaction products with said mineral carrier, the proportions of methylrosaniline chloride being in the range of from about 0.1% to 5% by weight and the proportions of acid being in the range of from about 0.1 to 10% by weight based on the weight of said mineral carrier, and mixing the resulting mass to thoroughly disperse the methylrosaniline chloride and acid throughout the carrier to provide a product in which the acid or its reaction product is in intimate contact with said methylrosaniline chloride on the mineral carrier to thereby facilitate said release of the methylrosaniline chloride from the carrier.

4,044,153

ANTIINFLAMMATORY 2-AMINOMETHYL-6-TRIHALOMETHYLPHENOLS

Everett M. Schultz, Ambler, and Edward J. Cragoe, Jr., Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

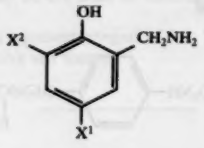
Continuation of Ser. No. 600,990, Aug. 1, 1975, Pat. No. 3,979,361, which is a continuation-in-part of Ser. No. 444,200, Feb. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 120,730, March 3, 1971, Pat. No. 3,794,734. This application May 7, 1976, Ser. No. 684,138

The portion of the term of this patent subsequent to Feb. 26, 1991, has been disclaimed.

Int. Cl.[2] A61K *31/135*

U.S. Cl. 424—330 **2 Claims**

1. A pharamaceutical composition comprising an antiinflammatory effective amount of a compound of the formula:



wherein X^1 is C_{1-7} lower alkyl, or cycloalkyl containing 5 to 6 carbon atoms; and X^2 is trifluoromethyl; or the non-toxic pharamaceutically acceptable salts thereof in a pharamceutically acceptable carrier.

4,044,154

SALTS OF 6-O-ACYL ASCORBIC ACID FOR YEAST-RAISED BAKED PRODUCTS

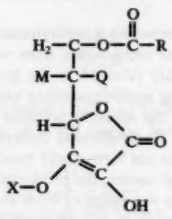
Russell C. Hoseney; Paul A. Seib, and Charles W. Deyoe, all of Manhattan, Kans., assignors to The Kansas State University Research Foundation, Manhattan, Kans.

Filed Nov. 17, 1975, Ser. No. 632,353
Int. Cl.[2] A21D *2/14*
U.S. Cl. 426—21 **12 Claims**

1. A method of preparing an improved yeast-leavened dough or batter comprising the steps of:

admixing the ingredients making up the yeast-leavened dough or batter; and

adding to said dough or batter prior to the baking or frying thereof from about 0.25 to 1.5% (baker's weight) of a compound of the formula



wherein M and Q are different and respectively taken from the group consisting of —H and —OH, R represents an aliphatic group having from 12 to 18 carbon atoms, inclusive, and X is a salt-forming member selected from the group consisting of sodium, potassium, calcium and magnesium.

4,044,155

NONFAT DRY MILK SUBSTITUTE FOR YEAST-LEAVENED BAKED PRODUCTS

Russell C. Hoseney, and Rujira Srisuthep Ling, both of Manhattan, Kans., assignors to The Kansas State University Research Foundation, Manhattan, Kans.

Filed Dec. 16, 1975, Ser. No. 641,293
Int. Cl.[2] A21D *2/02, 2/36*
U.S. Cl. 426—62 **15 Claims**

1. A yeast-leavened dough comprising respective quantities of flour, water, yeast, and a nonfat dry milk substitute, said substitute consisting essentially of:

deproteinized whey;

a quantity of a substance providing from about 1 to 10% by weight of ammonium ion in the substitute; and from about 20 to 60% by weight of a protein supplement;

said dough containing the substitute in an amount to provide about 0.02 to 0.2% (baker's weight) of ammonium ion in the dough.

4,044,156

RUMINANT FEED SUPPLEMENT AND PROCESS FOR PRODUCING SAME

Uriel Diner, and Richard MacLeod Elofson, both of Edmonton, Canada, assignors to The Research Council of Alberta, Edmonton, Canada

Filed Dec. 24, 1974, Ser. No. 536,118
Int. Cl.[2] A23K *1/14*
U.S. Cl. 426—69 **3 Claims**

1. A process for producing a non-protein nitrogen feed supplement for ruminants which comprises:

mixing glucose, produced by the hydrolysis of starch in grain selected from the group consisting of barley, wheat and corn, said glucose still being associated with the other normal constituents of the grain, with water, urea and sufficient mineral acid to provide a mixture having a starting pH of about 2 - 4, said glucose being the major dry matter constituent of said mixture; and

drying the mixture at an elevated temperature for sufficient time to cause urea and the major portion of the glucose to react and form urease - resistant glucosyl ureides in solid form.

4,044,157

PROCESS FOR PREPARING EXPANDED SOYBEAN GRANULES

Morris D. Wilding, Downers Grove, Ill., assignor to Swift & Company, Chicago, Ill.

Continuation-in-part of Ser. No. 436,358, March 1, 1965, abandoned. This application May 29, 1967, Ser. No. 642,208
Int. Cl.[2] A23J *3/00*
U.S. Cl. 426—250 **16 Claims**

1. A method for preparing an improved protein food product comprising: forming a dough containing from about 15% to about 45% by weight, of water and defatted, undenatured, solvent-extracted oil seed protein material; heating said dough for a period of time less than about five minutes under pressure to a temperature of about 260° F. to about 380° F., sufficient to rapidly denature the protein of said dough, said dough having sufficient plasticity to be extruded in a self-binding form; and extruding said heated dough into an area of reduced pressure under conditions causing the dough to expand by the flashing of moisture therefrom, and causing sufficient denaturation to occur prior to said heated dough reaching said area so as to cause the product to retain an elongated cellular structure created by said flashing of moisture upon reaching said area.

4,044,158

CASEINATE REPLACEMENT FOR PET FOOD USING A NEUTRAL CHELATING AGENT

Morris P. Burkwall, Jr., Marengo, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Continuation-in-part of Ser. No. 598,415, July 23, 1975, abandoned. This application July 19, 1976, Ser. No. 706,536
Int. Cl.[2] A23K *1/18, 1/10, 1/14*
U.S. Cl. 426—271 **11 Claims**

1. In a marbled, semi-moist pet food comprising:

about 5 percent to about 50 percent by weight meat or meat by-products;

about 15 to about 50 percent by weight moisture content;

about 5 percent to about 35 percent by weight sugar;

up to about 1 percent by weight of an antimycotic;

about 1 to bout 20 percent by weight polyhydric component;

and casein salt, the improvement comprising

replacing at least part of the casein salt with about 1 to about 26 percent by weight vegetable protein; about 4 to about 25 percent by weight starch; and at least 0.01 percent by weight of at least one edible substantially neutral chelating agent — wherein the pH of the pet food is 6.3 to 7.2

4,044,159
EXTRUDED CEREAL PRODUCT AND ITS PREPARATION

Roger J. Lutz, Fremont, Mich., assignor to Gerber Products Company, Fremont, Mich.

Continuation of Ser. No. 185,871, Oct. 1, 1971, abandoned. This application Sept. 17, 1973, Ser. No. 398,032
Int. Cl.[2] A23L *1/164*
U.S. Cl. 426—302 4 Claims

1. A process for preparing a nutritional, ready-to-eat expanded cereal product in the form of thin flakes, especially suitable for the feeding of junior-age infants, from a moist, free flowing blend formed of dry ingredients including cereal grain, consisting essentially of the steps of: blending the dry ingredients with from 12 to 30% by total weight of water; providing an extruder having a diehead opening in the range of 1/16 to ¼ inch; cooking said blended ingredients at a temperature of about 300° F while simultaneously extruding the same from said diehead opening under sufficient pressure to provide a product form expanded by a factor of about 3; slicing said expanded form into flakes of a thickness of about 0.005 to 0.2 inches; and drying said flakes at a temperature of about 300° F to a moisture content of less than about 5% by total weight.

4,044,160
ANTIMICROBIAL AND ANTIRANCIDITY AGENT

David R. Erickson, Downers Grove, and Robert B. Tompkin, LaGrange, both of Ill., assignors to Swift & Company, Chicago, Ill.

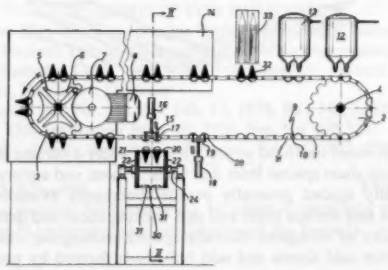
Continuation of Ser. No. 587,085, June 16, 1975, abandoned. This application June 15, 1976, Ser. No. 696,390
Int. Cl.[2] A23C *9/08;* A23D *5/04;* A23L *3/34*
U.S. Cl. 426—330 11 Claims

7. A method for inhibiting the development of microorganisms in an aqueous material, said method comprising adding a microorganism growth inhibitor to an aqueous material, said aqueous material containing water and being a biodegradable material in which microbial growth normally occurs, said microorganism growth inhibitor consisting essentially of tertiary butyl hydroquinone at a bacteriostatic concentration that inhibits microbial growth in said aqueous material, said bacteriostatic concentration in the aqueous material being greater than the concentration known to inhibit oxidative rancidity and being based on the total weight of the aqueous material.

4,044,161
AUTOMATIC ICE CREAM MANUFACTURING MACHINE

Giovanni Tanara, Parma, Italy, assignor to Ice Cream Engineering di G. Tanara & C. S.a.s., Parma, Italy

Filed Feb. 2, 1976, Ser. No. 654,414
Claims priority, application Italy, Feb. 10, 1975, 42505/75
Int. Cl.[2] A23G *9/26*
U.S. Cl. 426—421 4 Claims



1. Process for manufacturing ice cream of the type consisting of a hardened creamy mass and in which a support stick is embedded, comprising the following operations in succession:

feeding one or more different types of creamy material by known proportioning devices into suitable deformable elastomer recesses,

inserting a stick into said recesses in succession,

introducing said recesses into a chamber at very low temperature of the order of 40° - 45° C below zero, for a time of approximately 40 - 46 minutes;

withdrawing said recesses from said chamber and feeding them inverted to a suitable discharge station;

deforming said recesses by acting on them externally from above with a suitable pressure to make them assume an inverted symmetrical configuration, with the consequent expulsion of the hardened creamy mass;

subsequently deforming said recess in the opposite direction to make them assume their initial configuration.

3. Automatic machine for manufacturing blocks of ice cream and the like comprising a refrigerated chamber, a conveyor which travels along part of its path of travel in the open air and part of said path within said chamber, transverse members on said conveyor, each consisting of a plate of elastomeric material defining recesses having walls thinner than said plate, feed means for a creamy material, spray means for material in aqueous suspension and feeder means for a wooden stick or cone of edible material upstream of said refrigerated chamber, and means located on oppcsite sides of said conveyor downstream of the refrigerated chamber for causing said recesses to assume an inverted configuration symmetrical with respect to their initial configuratiion and then returning them to their initial configuration.

4,044,162
DECAFFEINATED COFFEE OF IMPROVED FLAVOR

Frank Lando, Wayne, N.J., and Charles Leonard Teitelbaum, New York, NY, assignors to General Foods Corporation, White Plains, N.Y.

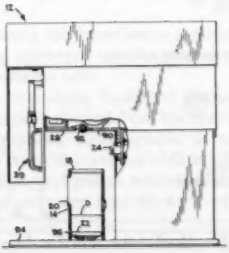
Filed Nov. 14, 1973, Ser. No. 415,924
Int. Cl.[2] A23F *1/10*
U.S. Cl. 426—427 6 Claims

1. In a method of decaffeinating coffee wherein caffeine-containing green coffee is contacted with an extraction medium comprised of a water extract of green coffee solubles to effect caffeine removal from said coffee, the improvement comprising adding sucrose to said extraction medium in an amount sufficient to result in a decaffeinated green coffee having at least about 6% sucrose by dry weight.

4,044,163
METHOD FOR FORMING DOUGH BARRIER

Mounir A. Shatila; William H. Von Der Lieth, both of Blackfoot; John L. Veeneman, and Marion E. Thomas, both of Idaho Falls, all of Idaho, assignors to Ampco Foods Inc., San Francisco, Calif.

Continuation of Ser. No. 507,602, Sept. 19, 1974, abandoned. This application Nov. 24, 1976, Ser. No. 744,461
Int. Cl.[2] A23L *1/216;* A21C *3/04*
U.S. Cl. 426—502 2 Claims



1. An improved method for forming an impervious dough barrier upon start up of a potato dough forming and shaping

machine comprising the steps of providing a machine having an elongate chamber of uniform cross section which defines a discharge opening and a rear opening axially spaced from the discharge opening, the chamber having a side inlet opening adjacent the rear opening, mounting means for mounting the chamber in a substantially horizontal position with the side inlet opening in an upward position, devices in vertical alignment above the side inlet opening which form means for introducing preselected amounts of dry potato agglomerates and water along a vertical path into the chamber through the side inlet opening, a piston sized for a fluid-tight sliding fit within the chamber, a piston rod extending into the chamber through the rear opening and mounted to the piston to axially move the piston toward and away from the discharge opening to extrude dough through the discharge opening, the piston rod operating to terminate piston movement short of the discharge opening so as to retain in the chamber a dough mass constituting an impervious barrier for effecting formation of subsequent batches of dough from dry potato and agglomerates introduced through the side inlet opening, and dough shaping mechanism supported at the discharge opening for shaping the dough into shaped pieces as the dough is extruded through the discharge opening by the piston,

disengaging the piston from the rod,

supporting the piston in substantially horizontal orientation in alignment below the introducing devices,

placing the chamber in an empty condition with the discharge opening downward over the piston and in a substantially vertical orientation so that the piston seals the lowermost opening of the chamber,

activating the introducing devices to deposit into the chamber through the rear opening preselected quantities of dry potato agglomerates and water,

maintaining the piston and chamber in position until the water has thoroughly wetted the potato agglomerates so as to form a set dough sufficiently stiff to retain a charge of potato agglomerates and water in said chamber and

installing the chamber in horizontal relationship beneath the introducing devices after completion of said maintaining step, and extruding the stiff dough through the discharge opening, such that at least part of the stiff dough remains in the chamber after extruding the dough through the discharge opening so as to afford formation of a subsequent dough charge while the chamber is in the horizontal position.

4,044,164

USES OF α-OXY(OXO) SULFIDES AND ETHERS IN FOODSTUFFS AND FLAVORS FOR FOODSTUFFS

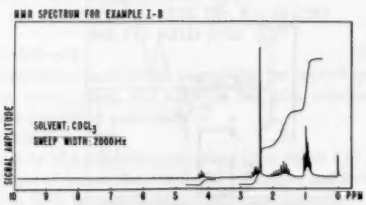
William J. Evers, Red Bank; Howard H. Heinsohn, Jr., Hazlet, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Oct. 7, 1976, Ser. No. 730,537

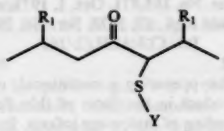
The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.

Int. Cl.[2] A23L *1/226, 1/235*

U.S. Cl. 426—535 **14 Claims**



1. A process for augmenting or enhancing the taste or aroma of a foodstuff comprising the step of adding to said foodstuff from about 0.1 ppm up to about 50 ppm by weight of said foodstuff of an alpha oxosulfide compound having the structure:



wherein R_1 is hydrogen or methyl and Y is one of C_1–C_4 alkyl or C_3 or C_4 alkenyl.

4,044,165

PROCESS FOR PREPARING PRECOOKED PASTA PRODUCTS

Gérard Baumann, 60 Avenue Henri Martin, 75016 Paris, France

Filed Aug. 29, 1975, Ser. No. 609,075

Claims priority, application France, Aug. 29, 1974, 74.29492

Int. Cl.[2] A23L *1/16*

U.S. Cl. 426—557 **7 Claims**

1. A process of producing precooked pasta products with a good shelf-life and having, after preparation at the time of consumption, the usual looks, taste and flavor of ordinary pasta products, consisting essentially of, mixing without heating, wheat semolina with 15 to 20% by weight of cold water on the basis of the weight of the semolina to form a dough and thereafter cooking and simultaneously extruding the thus obtained dough under high pressure at temperatures ranging between 90° C and 110° C to gelatinize the starch in the wheat semolina, and drying the extrusion-cooked product to a final moisture content of about 12.5% by weight.

4,044,166

EXPANDED BOARD OR SHEET-LIKE FOOD PRODUCT AND METHOD OF MANUFACTURING THE SAME

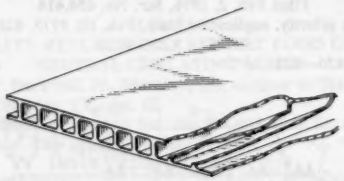
Eiji Koizumi, Niigata, Japan, assignor to Kameda Seika Co., Ltd., Niigata, Japan

Filed June 2, 1976, Ser. No. 692,037

Claims priority, application Japan, June 6, 1975, 50-68375; June 24, 1975, 50-78453

Int. Cl.[2] A21D *13/08;* A23L *1/16*

U.S. Cl. 426—560 **8 Claims**



1. A sheet-like food product having solely a surface sheet, a backing sheet spaced from said surface sheet, and a plurality of laterally spaced generally parallel bulkheads extending between said surface sheet and said backing sheet and defining a plurality of elongated laterally spaced rectangular chambers between said sheets and said bulkheads formed by passing a viscoelastic dough cake comprised of edible vegetable material through a gap between a pair of oppositely rotating rollers and subsequently through a gap between a pair of scrapers where the scrapers scrape the dough cake from the rollers and form the sheet-like food product.

4,044,167

METHOD FOR AROMATIZING SOLUBLE COFFEE

Michael D. Jolly, Highland Mills, N.Y.; Anthony T. Nacci, Bergenfield; Gaetano J. DeCeglie, Palisades Park, both of N.J., and Rudolf A. Vitti, Dumont, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 12, 1972, Ser. No. 252,757
Int. Cl.[2] A23F *1/04*
U.S. Cl. 426—594 4 Claims

1. A method for producing an aromatized soluble coffee product comprising the steps of:

a. combining coffee grinder gas aroma and water-soluble or water dispersible carbohydrate solids with a liquid glyceride, the carbohydrate solids being present at from 10 to about 40% by weight of the glyceride,

b. cooling the aromatized glyceride-carbohydrate material to a solid state,

c. comminuting the solidified aromatized glyceride-carbohydrate material,

d. blending the comminuted particles with a soluble coffee powder,

e. permitting the blend to warm to at least room temperature whereby liquefaction of the solidified aromatized glyceride-carbohydrate material occurs and the aromatized liquid spreads over the surface of the soluble coffee powder.

4,044,168

FLAVORED FAT COMPOSITION

Arie Steenhoek, Barendrecht, and Herman Olsman, Terborg, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Sept. 17, 1975, Ser. No. 614,295
Claims priority, application Netherlands, Sept. 18, 1974, 7412329
Int. Cl.[2] A23D *5/00*
U.S. Cl. 426—613 15 Claims

14. An improved frying fat composition, suitable for the preparation of a gravy, comprising

a. fat, wherein said fat is present in said composition at a level of at least about 80 percent by weight,

b. at least one proteinaceous material selected from the group consisting of whey powder and milk powder, wherein said whey powder is present in said composition at a level up to about 8 percent by weight, and said milk powder is present in said composition at a level up to about 2 percent by weight,

c. about 0.1 to about 1.5 percent of phosphatide, and

d. about 0.2 to about 5 mg equivalents per 100 grams of said composition of monoammonium adipate.

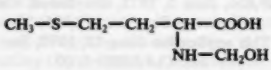
4,044,169

FEED ADDITIVE FOR RUMINANTS

Heidrun Bertram, Grossauheim; Rudolf Fahnenstich, Mombris, and Herbert Tanner, Grossauheim, all of Germany, assignors to Duetsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Division of Ser. No. 441,983, Feb. 13, 1976, Pat. No. 3,968,253.
This application Mar. 10, 1976, Ser. No. 665,575
Claims priority, application Germany, Feb. 16, 1973, 2307836
Int. Cl.[2] A23K *1/22*
U.S. Cl. 426—656 5 Claims

1. A ruminant feed containing an additive consisting essentially of N-hydroxymethyl methionine of the formula



or a non-toxic salt thereof.

4,044,170

SURGICAL IMPLANT AND METHOD FOR ITS PRODUCTION

Heinz Scharbach, Plankstadt; Achim Engelhardt, and Peter Bunz, both of Frankfurt, all of Germany, assignors to Pfaudler-Werke A.G., Schwetzingen, Germany

Division of Ser. No. 496,268, Aug. 9, 1974, Pat. No. 3,987,499.
This application Apr. 8, 1976, Ser. No. 675,129
Claims priority, application Germany, Aug. 10, 1973, 2340546
Int. Cl.[2] B05D *1/38, 7/14, 3/02*
U.S. Cl. 427—2 1 Claim

1. A method for the manufacture of a surgical implant comprising a metallic substrate wholly coated with porcelain enamel, comprising:

applying crystallizable porcelain enamel frit to part of said substrate;

firing said frit to form an enamel coating on part of said substrate;

subjecting said enamel coating to controlled heat treatment to partially crystallize said coating, whereby the viscosity of said coating is increased;

applying porcelain enamel frit to the remaining non-enamelled surface of said metallic substrate;

positioning said implant upon a firing support with said partially crystallized enamel in contact with said support; and

first the frit applied to the previously non-enamelled surface to form an enamelled coating over said surface.

4,044,171

PROCESS FOR POLYADDITION PRODUCTS WHICH CONTAIN URETDIONE GROUPS AND USE IN COATINGS

Hanns Peter Muller, Leverkusen; Kuno Wagner, Leverkusen-Steinbuechel, and Richard Muller, Bergisch-Neukirchen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 17, 1975, Ser. No. 569,112
Claims priority, application Germany, Apr. 27, 1974, 2420475
Int. Cl.[2] B05D *7/26;* C08G *18/79*
U.S. Cl. 427—27 18 Claims

8. A process for the coating of substrates which comprises:

a. mixing the cross-linking agent of claim 1 with from 5 to 85% by weight based on the total quantity of binder, of polyhydroxyl compounds free from uretdione groups having molecular weights of from 400 to 10,000 and conventional lacquer pigments and fillers,

b. coating the mixture on a substrate, and

c. heating the coating at temperatures in excess of 110° C until it hardens.

12. A process for the preparation of pulverizable latent cross-linking agents which comprises

1. dimerizing diisocyanates in the presence of a dimerization catalyst,

2. then inactivating the dimerization catalyst, and

3. reacting said dimerized reaction mixture containing said inactivated catalyst with

4. compounds containing hydrogen atoms reactive with isocyanate groups selected from the groups consisting of water and aliphatic, cycloaliphatic or araliphatic compounds with molecular weights of 62 to 300 which contain one or two hydroxyl groups wherein said compounds are comprised of no more than 60 wt.% of monohydroxy compounds,

5. wherein the reactants are used in such proportions that the NCO/OH ratio is between 1:1 and 1:1.6 and the products of the process contain from 5 to 20 wt.% of latent NCO groups and from 0 to 2 hydroxyl end groups.

4,044,172
WOOD TREATING PROCESS

Kenly C. Bugg, 1202 Sunset Drive, Fort Wayne, Ind. 46807

Filed June 2, 1975, Ser. No. 582,703
Int. Cl.[2] B05D *3/06, 3/02, 1/18*
U.S. Cl. 427—55 14 Claims

1. A process for coloring wood comprising:

applying to substantially all surfaces of the wood a continuous coating of a silicone treating liquid, and heating the coated wood to a temperature above about 170° C. and for a time sufficient to effect a predetermined color change in the wood; said treating liquid having a minimum viscosity of at least 75 centistokes at said temperature and also being substantially inert to the color-bearing constituents of the wood at said temperature.

4,044,173
ELECTRICAL RESISTANCE COMPOSITIONS

Alexander S. Laurie, Horsham, England, assignor to E. R. A. Patents Limited, Leatherhead, England

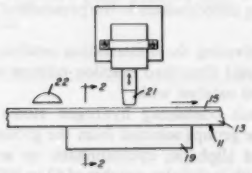
Continuation-in-part of Ser. No. 249,804, May 3, 1972, abandoned. This application Oct. 31, 1974, Ser. No. 519,717
Int. Cl.[2] H01B *1/06;* B05D *5/12*
U.S. Cl. 427—101 8 Claims

1. A process for forming a vitreous enamel electrical resistor coating on a substrate, said vitreous enamel containing an electrically conductive species as a crystalline phase and having a temperature coefficient of resistance, as measured in the temperature range of 20° to 120° C., of from −500 to +500 ppm/° C., comprising applying to a substrate a composition which comprises (1) a liquid organic medium, (2) a powdered aluminoborate glass, containing as a dissolved component, a metal oxide selected from the group consisting of molybdenum trioxide, tungsten troixide, cerium dioxide, manganese dioxide and ferric oxide in an amount of 2 to 30 mol percent based on the total amount of glass expressed as its component oxides and (3) a powdered reducing agent capable of withstanding glass firing temperature selected from the group consisting of boron, and silicon, in an amount of 0.25 to 30 percent by weight based on the total weight of glass and reducing agent, the relative proportions of (1), (2) and (3) being such that said compositions is a paste, and firing said paste on said substrate at a temperature of about 600° to 900° C. to form a vitreous enamel.

4,044,174
ULTRASONICALLY SMOOTHING A MAGNETIC LAYER ON A WEB

David L. Carr, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 69,203, Sept. 3, 1970. This application Aug. 14, 1972, Ser. No. 280,306
Int. Cl.[2] H01F *10/02*
U.S. Cl. 427—130 9 Claims



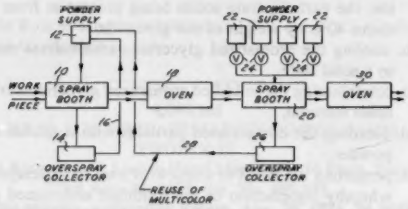
1. A method for smoothing a layer comprising magnetic particles in a binder on a carrier wherein said carrier is positioned in contact with a stationary anvil, said method comprising

effecting relative movement between said carrier and a vibrating ultrasonic horn having a vibrating surface in physical contact with said layer, causing said surface to pressure said layer to uniform smoothness.

4,044,175
METHOD OF RECYCLING POWDER COATINGS IN A PLURAL COATING OPERATION

J. Barton Coxon, Novi, and Kenneth R. Ling, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 29, 1975, Ser. No. 626,691
Int. Cl.[2] B05D *1/40, 3/12*
U.S. Cl. 427—195 1 Claim



1. A method of painting successive articles with powder paint which comprises the steps of:

a. establishing a first spray zone of powder paint for applying powder paint on each of the successive articles;

b. moving articles successively through the first spray zone so as to have a first coat of powder paint placed on each article;

c. fusing the first coat of powder paint on each of the articles after the articles have been moved through the first spray zone thereby to form an undercoat on each of the articles;

d. establishing a second spray zone of powder paint for applying a second coat of powder paint on each of the successive articles;

e. spraying a powder paint having a desired color on each of the successive articles passing through the second spray zone;

f. from time to time or from article to article changing the desired color sprayed in the second spray zone so that the successive articles are generally not of the same color;

g. moving successive articles through the second spray zone to receive a coating of a second powder paint having a color selected for that article;

h. fusing the second coating of powder paint on each of the successive articles after the articles have been moved through the second spray zone thereby to form a top coat on each of the successive articles;

i. collecting any over sprayed powder paint from the second spray zone, the second over sprayed paint being nonhomogeneous in color because it contains a mixture of the top coat color powders used in the second spray zone;

j. using the collected second over sprayed powder paint in the first spray zone as an undercoat powder paint;

k. collecting the overspray of the first spray zone and respraying in the first spray zone.

4,044,176
GRAPHIC ARTS AND GRAPHIC MEDIA

Leon E. Wolinski, Cheektowaga, and Arthur R. Endress, Hamburg, both of N.Y., assignors to Pratt & Lambert, Inc., Buffalo, N.Y.

Continuation-in-part of Ser. No. 378,704, July 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 342,744, March 19, 1973, Pat. No. 3,864,181, which is a division of Ser. No. 259,656, June 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 122,086, March 8, 1971, abandoned. This application June 12, 1975, Ser. No. 586,249
Int. Cl.[2] B05D *5/00*
U.S. Cl. 427—256 12 Claims

1. In a graphic arts medium for selective application to a

substrate comprising a polymeric film-forming binder and a volatile solvent vehicle therefor, the improvement comprising dispersing in said medium about 1 to 45 weight percent, based on the non-volatile content of said medium, of thermally expandable thermoplastic poly(vinylidene chloride) microspheres having a particle size of about 0.5 to 300 microns in diameter and containing about 5 to 50 weight percent of a volatile neopentane blowing agent, said microspheres being insolubilized in said volatile solvent vehicle by a coating of a compound which preferentially wets the surface of said microspheres, said compound being a member selected from the group consisting of alkyl alcohols having about 3 to about 5 carbon atoms in the alkyl chain.

7. The method of forming a raised graphic pattern upon a substrate which comprises selectively applying in a pattern to said substrate a graphic arts medium comprising a polymeric film-forming binder and a volatile solvent vehicle therefor, said medium having dispersed therein about 1 to 45 weight percent, based on the non-volatile content of said medium, of thermally expandable thermoplastic poly(vinylidene chloride) microspheres having a particle size of about 0.5 to 300 microns in diameter and containing about 5 to 50 weight percent of a volatile neopentane blowing agent, said microspheres being insolubilized in said volatile solvent vehicle by a coating of a compound which preferentially wets the surface of said microspheres, said compound being a member selected from the group consisting of alkyl alcohols having about 3 to about 5 carbon atoms in the alkyl chain, drying said medium and heating to expand said microspheres, whereby said medium forms a raised graphic pattern.

4,044,177

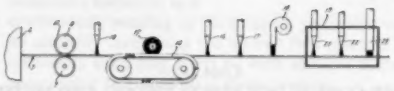
METHOD OF DECORATING AN EMBOSSED PLASTIC STRIP

Peter V. Paulus, Ypsilanti, Mich., and Theodore Loew, Schenectady, N.Y., assignors to The Standard Products Company, Cleveland, Ohio

Filed Mar. 25, 1976, Ser. No. 670,182

Int. Cl.[2] B05D *3/00, 5/00, 3/12*

U.S. Cl. 427—264 **3 Claims**



1. The method of forming a decorative trim strip comprising the steps of: extruding a plastic strip with a decorative surface having raised portions therein, applying a release agent to the entire decorative surface of the strip, abrading the raised surfaces of said strip to remove the release agent thereon so as to expose said raised surfaces, applying a coloring material to the entire decorative surface of said strip, and removing said release agent whereby said raised portions are highlighted by said coloring material.

4,044,178

PROCESS FOR REINFORCING NONWOVENS

Heinz Abel, Reinach; Rosemarie Toepfl, Basel, and Luzius Schibler, Rhine, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 275,117, July 26, 1972, abandoned.

This application Jan. 12, 1976, Ser. No. 648,430

Claims priority, application Switzerland, Aug. 4, 1971, 11473/71

Int. Cl.[2] B05D *3/02, 1/18*

U.S. Cl. 427—373 **19 Claims**

1. A process for reinforcing nonwoven fiber material by a foaming process, comprising the steps of

A. impregnating the nonwoven fiber material with an aqueous preparation containing a water-soluble or water-dispersible binding agent and a foaming assistant, wherein the binding agent is a reaction product obtained by reacting, in the presence of an organic solvent,

a. an epoxide which contains at least 2 epoxide groups per molecule,

b. a fatty amine having 12 to 22 carbon atoms, and

c_1. an aliphatic, saturated dicarboxylic acid containing 7 to 14 carbon atoms, and wherein the foaming assistant is a reactive surfactant which is convertable into the irreversibly insoluble state at elevated temperature and thereby loses its surface activity, the foaming assistant being a surface active methylolmelamine or methylolurea having methylol groups etherified with a monoalcohol of 4 to 22 carbon atoms and at least one member of the group consisting of an alkanolamine of 2 to 6 carbon atoms, a polyethyleneglycol having an average molecular weight of 1000 to 5000, an alkanol of the formula $H—(OCH_2CH_2)_m—OH$ where m is 1 to 25 and which contains an alkali metal sulfonate group bonded to carbon and an aliphatic-hydroxy-carboxylic acid containing 2 to 4 carbon atoms, and

B. subsequently heating the impregnated non-woven fiber material at 60° to 190° C to convert the foaming assistant to an irreversibly insoluble state and to destroy the surface activity of the foaming assistant.

4,044,179

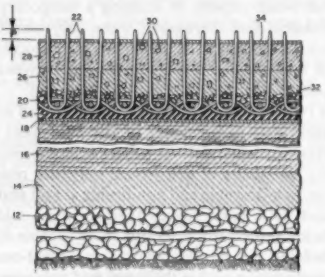
PLAYING SURFACE FOR ATHLETIC GAMES

Frederick T. Haas, Jr., Metairie, La., assignor to MOD-SOD Sport Surfaces, Metairie, La.

Filed Nov. 18, 1975, Ser. No. 632,970

Int. Cl.[2] D03D *27/00;* **D04H** *11/00*

U.S. Cl. 428—17 **10 Claims**



1. A playing surface for athletic games comprising:

a. a substantially flat, firm subsurface;

b. a pile fabric disposed on said subsurface comprising a relatively flexible, substantially moisture-impermeable backing and normally generally upstanding pile elements resembling grass; the length of said pile elements lying in the range from about ½ to about 1½ inches;

c. A compacted layer of weather-resistant, mineral, granular material disposed among said pile elements on said backing; the depth of said granular material layer lying in the range from about 75% to substantially equal to the length of said pile elements and being substantially uniform over the entire area of said playing surface;

d. said mineral material comprising less than 10% clay and further comprising a quantity of moisture retaining material sufficient to maintain the moisture content of said mineral material above about 3% by weight under normal climatic conditions.

4,044,180

SHEET STRUCTURE

Robert C. Baker, 1395 Northwestern Natl. Bank Bldg., St. Paul, Minn. 55101

Continuation-in-part of Ser. No. 338,963, March 7, 1973, abandoned, which is a continuation-in-part of Ser. No. 192,241, Oct. 26, 1971, abandoned, and Ser. No. 300,788, Oct. 25, 1972, Pat. No. 3,776,644. This application May 2, 1975, Ser. No. 573,834

Int. Cl.² B65D *29/02;* B32B *27/36*

U.S. Cl. 428—35 **8 Claims**

1. A composite flexible sheet material especially useful in the packaging art, comprising

i. a base sheet structure of permanently united layers including a thermoplastic polymeric resin layer which is non-sticky at room temperature but is flowable and fusible at predetermined sealing conditions of elevated temperature above 50° C and the application of pressure, and a polyester resin backing film which is substantially non-flowable and non-fusible at said sealing conditions, the rear surface of said backing film away from said thermoplastic layer being non-fibrous, said thermoplastic layer being of greater thickness than said backing film and being normally non-sticky to said rear surface of said backing film but being capable of forming a temporary peelable mechanical seal theragainst when subjected to said sealing conditions, any such temporary mechanical seal being free of intermingled fused constituents between said thermoplastic layer and said backing film, and

ii. a recess-containing layer adhered to and exposed on said thermoplastic layer side of said base sheet structure, said recess-containing layer being non-compressed and consisting essentially of non-woven polyester resin fibers which are non-flowable and non-fusible at said sealing conditions and have open spaces therebetween, said open spaces being sufficiently extensive to be capable of mechanically holding and carrying an organic-diluent-containing messy composition within the same, said polyester resin fibers of said recess-containing layer being characterized by the fact that they are resistant to irretrievable adsorption of any said organic-diluent-containing messy composition, the quantity relationship between said fibers of said recess-containing layer and the material of said thermoplastic layer of said composite sheet material being such that said recess-containing layer is capable of being substantially submerged into said thermoplastic layer of said base sheet structure upon the application of said sealing conditions, and

iii. a temporary peelable mechanical seal extending as a narrow band of no more than about one centimeter in width with material of said thermoplastic layer against the rear surface of said backing film and containing within said band of seal said recess-containing layer submerged into said thermoplastic layer, said temporary seal being spaced from edges of said base sheet structure and being rupturable at the interface between material of said thermoplastic layer and the rear surface of said backing film

4,044,181

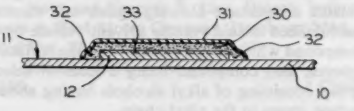
DECALCOMANIA IMAGE TRANSFER SYSTEM

Ronald D. Edhlund, 418 N. Fairview, Mount Prospect, Ill. 60056

Filed May 21, 1975, Ser. No. 579,371

Int. Cl.² B32B *3/10, 7/06, 27/24, 27/38*

U.S. Cl. 428—40 **9 Claims**



1. A system for transferring decalcomania images to a receiving surface, which system comprises: a non-stretching styrene base sheet having a smooth surface free of irregularities; at least one image formed of ink or lacquer deposited on and in intimate contact with surface of said base sheet and composed of a flexible decal ink or lacquer which does not chemically react with said base sheet, said smooth base sheet surface precluding leakage of air into the interface area between said image and said base sheet surface owing to intimate contact, whereby said image clings to said base sheet primarily because there is no air at the surface between the image and base sheet when said ink or lacquer is dry, and a pressure sensitive adhesive, said adhesive having a readily oxidizable outer surface film, said adhesive further extending over and bonding to a thin outer layer of the exposed surface of said image without penetrating through the image while said oxide protects the adhesive underlying said surface film from drying so that the bond between said adhesive and said image is stronger than the bond primarily caused by an absence of air space at the interface between said image and said base sheet.

4,044,182

VENEER CORE BLOCK FOR PLYWOOD AND METHOD FOR FORMING SAME

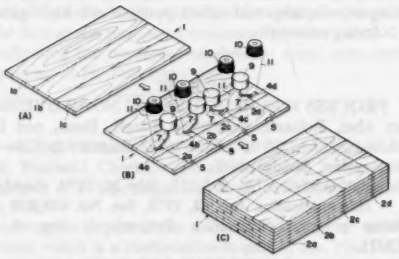
Noboru Aizawa, Anjo, Japan, assignor to Hashimoto Denki Co., Ltd., Takahama, Japan

Filed June 8, 1976, Ser. No. 694,038

Claims priority, application Japan, June 14, 1975, 50-71447

Int. Cl.² B32B *3/10, 29/02;* B27F *7/00*

U.S. Cl. 428—44 **8 Claims**



6. A veneer core block for a plywood, comprising a plurality of green veneer strips contacted closely side by side, said green veneer strips having a plurality of inclined slits and strings with an adhesive within said slits, thereby connecting said green veneer strips to form a veneer core block.

4,044,183

SYNTHETIC SUEDE AND PROCESS THEREFOR

Norman Forrest, 216 Byram Road, Byram, Conn. 10573

Filed Nov. 4, 1976, Ser. No. 738,918
Int. Cl.[2] D06C *11/00*; B32B *33/00*
U.S. Cl. 428—91 13 Claims

1. A method of continously producing a synthetic suede product which comprises the following sequential steps:

a. continuously feeding an assembly of at least three feed materials into a nip formed by two rotating cylinders, each of said rotating cylinders carrying a preheated, endless silicone rubber molding band the outer surfaces of which are provided with a multiplicity of cavities, the separate feed materials comprising two outer polyurethane film layers, and at least one inner layer comprising a polyurethane consisting of film sheet, web or foam;

b. continuously compressing said assembly in said nip at a temperature of from about 385° to 410° F and at a pressure of from about 65 to 100 psi whereby the outer polyurethane film are are in a molten state, a major proportion of said molten polyurethane being forced into said cavities, and wherein the remaining portion of the outer polyurethane films and the inner layers are welded together;

c. continuously passing the resulting composite assembly compressed between molding bands into a cold water bath maintained at a temperature sufficiently cold to solidify any molten feed material;

d. continuously stripping the composite assembly from the molding bands by passing the molding bands over a pair of rotating cylinders provided with an internal vacuum and gripping the composite assembly with a pair of rotating cylinders covered with card clothing which perforates the composite assembly; and

e. continuously winding up the stripped, perforated composite assembly comprising the layered feed material having outwardly extending fibers on both surfaces thereof and constituting said synethetic suede product.

10. A perforated synthetic suede product having the appearance and feel of natural suede leather which is characterized by polyurethane fibers extending outwardly from two outer polyurethane surface layers welded to at least one inner layer comprising a polyurethane film, sheet, web or foam.

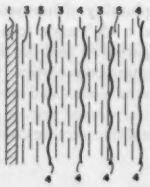
4,044,184

CRYOGENIC INSULATING STRUCTURE

Kaneyoshi Ashida, Chofu; Masaaki Ohtani, Kawasaki; Makoto Ichii, Yokohama, and Tatsuhiko Kobayashi, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Continuation of Ser. No. 483,715, June 27, 1974, abandoned. This application Sept. 12, 1975, Ser. No. 612,853
Claims priority, application Japan, June 27, 1973, 48-72633; Sept. 17, 1973, 48-104763
Int. Cl.[2] B32B *3/26*
U.S. Cl. 428—113 7 Claims

1. A cryogenic heat insulating structure, which comprises: a wall on whose surfce is coated a plurality of superposed rigid resin foam layers each of which has a surface skin layer of a thickness of from 0.2 to 0.6 mm having a surface membrane free of rigid foam which skin layers possess a density gradient between the maximum density of the resin and the density of the foam layer, wherein each foam layer is formed by simultaneously spraying a fiber and a foamable resin, and contains fibers oriented parallel to said wall.



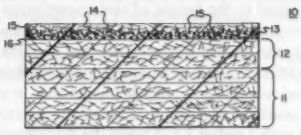
2. The insulating structure of claim 1, wherein said fibers are glass fibers having a length of 10–100 mm.

4,044,185

DECORATIVE SHEET FOR SOLID COLOR LAMINATES

Harold O. McCaskey, Jr., Allendale, S.C., and Salvatore E. Palazzolo, Elizabeth City, N.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 20, 1975, Ser. No. 542,311
Int. Cl.[2] B32B *3/00, 29/00*
U.S. Cl. 428—153 10 Claims



1. A machinable, colored, postformable decorative plastic laminate comprising a core layer of a plurality of resin impregnated fibrous sheets, and superimposed thereon a resin impregnated, colored decorative layer consisting of fibrous material selected from the group consisting of rayon, cellulose wood pulp and mixtures thereof, coloring particles having a Moh's hardness of up to about 6 and an average particle size range between about 53 to 210 microns and resin; wherein the weight ratio of fibrous material:coloring particles is from about 1:0.04 to 1:0.4; the colored decorative layer characterized in that the coloring particles are dispersed only through the bottom two-thirds of the colored layer and concentrated in the colored layer near the core-decorative layer interface, the top one-third of the colored layer containing substantially no coloring particles, the colored laminate characterized by having no separate clear protecting overlaying layer.

4,044,186

SHEAR FLEXIBILITY FOR STRUCTURES

Maynard L. Stangeland, Calabasas, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

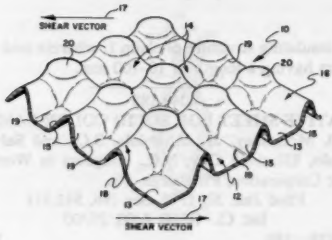
Division of Ser. No. 504,927, Sept. 11, 1974, Pat. No. 3,956,543, which is a continuation-in-part of Ser. No. 294,403, Oct. 2, 1972, abandoned. This application Jan. 26, 1976, Ser. No. 652,594
Int. Cl.[2] B32B *3/30, 15/00*
U.S. Cl. 428—167 4 Claims

1. In a combination including a flexible member connected between components that will withstand shear translation up to 0.5 percent across said member, said components being capable of independent movement therebetween comprising:

a first component, and

a second component spaced from said first component and adapted to move laterally with respect to said first component, said flexible member being attached to adjacent edges of said first and second components bridging the space between said components, the improvement wherein said flexible member comprises a flat sheet of metal formed with a plurality of linearly extending inter-

secting convolutions at right angles to one another having a constant cross-section, the radius of said intersecting convolutions is 6 to 12 times the thickness of said sheet of metal, each of said plurality of intersecting convolutions being substantially at a 45 ° angle to a shear vector and shear translation imparted to said flat sheet of metal, the height of said intersecting convolutions is 9 to 17 times the thickness of said sheet of metal, said intersecting convolution having a spherical domed region extending beyond the apex of each of said intersecting convolutions approxi-



mately equal to the height of said convolution of the area of intersection, said spherical domed region serves to interrupt the principal stress lines that act along said apex of each of said convolutions when said flexible member is subjected to said shear vector translations, a wall portion of said constant cross-section intersecting convolutions is formed with a radius 3 to 5 times the thickness of the metal between said wall of said convolutions and a flat portion of said sheet of metal and a radius 3 to 5 times the thickness of the metal between said spherical domed region and said intersecting convolutions.

4,044,187

FILM LAMINATES HAVING A REIRRADIATED LAYER

William P. Kremkau, Watkinsville, Ga., assignor to W. R. Grace & Co., Duncan, S.C.

Filed May 22, 1975, Ser. No. 580,103
Int. Cl.[2] B05D *3/06*; B32B *7/02, 27/08*
U.S. Cl. 428—212 **20 Claims**

1. A method of improving the properties of polymeric film laminates comprising the steps of:

a. forming a laminate by preparing a layer that is cross-linked and applying at least one additional polymeric layer thereto, at least one of said additional layers being uncross-linked but being cross-linkable by irradiation; and,

b. irradiating said laminate.

4,044,188

STAMPABLE THERMOPLASTIC SHEET REINFORCED WITH MULTILENGTH FIBER

Leon Segal, Randolph, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 293,975, Oct. 2, 1972, abandoned. This application Apr. 1, 1975, Ser. No. 564,019
Int. Cl.[2] B32B *5/16*
U.S. Cl. 428—283 **10 Claims**

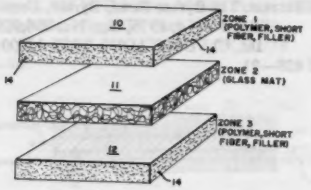
1. A smooth surfaced thermoplastic composite sheet having an average surface roughness height under 500 microinches comprising, in percent by weight of the total composite,

a. from about 25 to 65% of a synthetic thermoplastic resin,

b. from about 25 to 40% of a particulate filler,

c. from about 15 to 45% of short glass reinforcing fibers having a length of not greater than about 0.85 inch, at least 50% of said fibers being aligned substantially parallel to the plane of the sheet, and

d. from about 2% to 10% of long glass fibers having a length



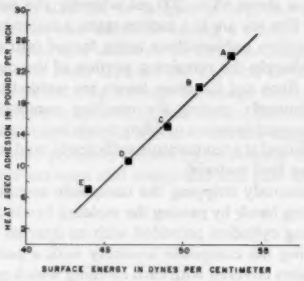
of about 1½ inches to continuous and being substantially below the exterior surface of the composite sheet.

4,044,189

SURFACE TREATED POLYESTER SUBSTRATES

Robert J. Arrowsmith, Charlotte, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Continuation of Ser. No. 14,479, Feb. 26, 1970, abandoned. This application Sept. 7, 1972, Ser. No. 287,123
Int. Cl.[2] C08G *63/12*; B31B *27/38*
U.S. Cl. 428—295 **9 Claims**



1. A filament reinforced rubber article, the reinforcing filament being a polyester filament having a surface energy greater than 45 dynes per centimeter and having a surface which is substantially chemically unmodified.

4,044,190

COATED METAL ARTICLE

John J. Miller; Richard E. Baus, both of Warminster, and Sheldon N. Lewis, Willow Grove, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 360,856, May 16, 1973, abandoned. This application June 12, 1975, Ser. No. 586,327
Int. Cl.[2] B05D *3/02*; B32B *15/08*; B22B *27/30*
U.S. Cl. 428—463 **8 Claims**

1. As an artilce of manufacture, a coated metallic substrate having a fused thermoset coating thereon derived from powdered polymeric material consisting essentially of a polymeric material having units derived from:

1. about 1 to about 30% by weight of a (C_4–C_8)-hydroxyalkyl ester of acrylic acid or methacrylic acid or a mixture of said hydroxyalkyl esters;

2. about 1 to about 30% by weight of a monoethylenically α,β-unsaturated carboxylic acid or a mixture of said acids; and

3. about 55 to about 98% by weight of a (C_1–C_{18}) alkyl ester of acrylic acid or methacrylic acid, or a mixture of said alkyl esters, or an admixture containing said mixtures and up to about 60% by weight of the admixture of an additional copolymerizable α,β-ethylenically unsaturated monomer or monomers, wherein about 7 to about 95% of the carboxylic acid groups of the polymeric material have been neutralized to sodium, potassium, or barium carbox-

ylate groups, the carboxylate groups thus being partially neutralized, the polymeric material having been derived from a liquid composition having an alkaline pH.

4,044,191

ELECTRIC CELLS

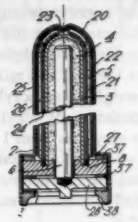
Leslie Samuel Evans, Reading; Roger John Bones, Abingdon, and John Richard Harbar, Wantage, all of England, assignors to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, England

Filed Nov. 17, 1975, Ser. No. 632,784

Claims priority, application United Kingdom, Dec. 24, 1974, 55767/74

Int. Cl.[2] H01M *4/36*

U.S. Cl. 429—104 **8 Claims**



1. An electric cell having a liquid alkali metal anode and a liquid cathode which reacts with said liquid alkali metal anode and comprising,

a solid electrolyte;

a liquid anode compartment having a side which is partially bounded by one side of the solid electrolyte, said liquid anode compartment being of very limited capacity so as to contain only a very limited proportion of the liquid anode required by the cell but being incapable of capillary action and being shaped so that the compartment generally follows the contour of the solid electrolyte so as to present a shallow spaced for the liquid anode normal to the surface of the solid electrolyte;

a liquid cathode compartment which is partially bounded by the other side of the solid electrolyte;

a reservoir for storing the bulk of the liquid anode;

barrier means lying between the liquid anode compartment and the reservoir and shaped so as to separate the liquid anode compartment from said reservoir, said barrier means preventing liquid cathode, which might leak into the liquid anode compartment in the event of damage to the solid electrolyte, from reaching the reservoir; and

a capillary duct, removed from the solid electrolyte and connected between the liquid anode compartment and the reservoir, for providing a restricted feed of liquid anode therethrough, said duct providing feeding of that amount of liquid anode required during normal discharge of the cell but limiting higher rates of feed of liquid anode.

4,044,192

THERMAL BATTERIES

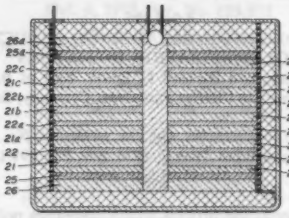
George C. Bowser, Jr., Towson, and Richard L. Blucher, Baltimore, both of Md., assignors to Catalyst Research Corporation, Baltimore, Md.

Filed July 10, 1970, Ser. No. 56,023

Int. Cl.[2] H01M *6/00*

U.S. Cl. 429—112 **9 Claims**

1. A thermal battery comprising an aligned stack of annular elements forming a toroidal cell stack having a central hole therethrough and an outer peripheral surface, said elements comprising an anode, a pellet element consisting essentially of an intimate finely divided mixture of a depolarizer, a fusible electrolyte and an inert absorbent, a cathode and a combustible composition that forms an electrically conductive ash on burning, a layer of rigid, nonporous electrical insulating material



tightly engaging and covering said peripheral surface and a solid electrical insulating fuze material filling said central hole.

4,044,193

FINELY PARTICULATED COLLOIDAL PLATINUM COMPOUND AND SOL FOR PRODUCING THE SAME, AND METHOD OF PREPARATION OF FUEL CELL ELECTRODES AND THE LIKE EMPLOYING THE SAME

Henry G. Petrow, Watertown, and Robert J. Allen, Saugus, both of Mass., assignors to Prototech Company, Newton, Mass.

Continuation-in-part of Ser. No. 153,824, June 16, 1971, abandoned, which is a continuation of Ser. No. 430,190, Dec. 28, 1973, abandoned. This application Dec. 20, 1974, Ser. No. 534,731

Int. Cl.[2] H01M *8/00, 4/86, 4/88*

U.S. Cl. 429—40 **34 Claims**

1. In a fuel cell and the like, a catalytic electrode comprising an electrically conductive high surface area substrate on which has been deposited platinum particles of the order of substantially 15 to 25 Angstroms in particle size and in which said particles are formed from one of an oxidative decomposition of a platinum complex comprising an oxidizable ligand, and hydrolysis of a non-complex platinum salt solution.

4,044,194

ELECTRIC BATTERIES

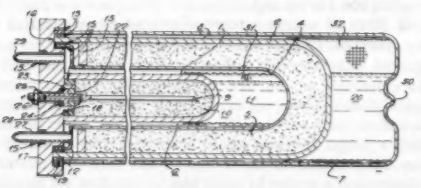
Leslie Samuel Evans, Upper Basildon, and John Richard Harbar, Grove, near Wantage, both of England, assignors to Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdon of Great Britain and Northern Ireland, United Kingdom

Filed June 30, 1975, Ser. No. 591,322

The portion of the term of this patent subsequent to Jan. 13, 1993, has been disclaimed.

Int. Cl.[2] H01M *4/36*

U.S. Cl. 429—104 **9 Claims**



1. An electric battery having at least two electric cells, each said cell having a solid electrolyte with liquid sodium on one side and liquid sulphur on the other side, as the cell reactants, the improvement wherein the solid electrolytes are of tubular form enclosed at one end and disposed substantially concentrically one within the other and said battery further comprises common electrode means of tubular form closed at one end and disposed substantially concentrically between adjacent

solid electrolytes so as to electrically connect the adjacent cells and at least in part separate the cell reactants in said adjacent cells.

4,044,195

ORGANOLITHIUM/ALKADIENOL ADDUCTS AS POLYMERIZATION INITIATORS

Carl A. Uraneck, and Richard L. Smith, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

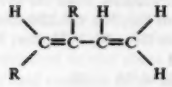
Division of Ser. No. 625,745, Oct. 24, 1975, Pat. No. 3,993,854. This application June 8, 1976, Ser. No. 694,122

Int. Cl.[2] C08F *4/48*

U.S. Cl. 526—29 **59 Claims**

1. A polymerization process which comprises polymerizing at least one vinylidene group-containing polar monomer under anionic solution polymerization conditions in a hydrocarbon diluent employing a lithium-based adduct as polymerization initiator, effective polymerization conditions of temperature, pressure, and time, and effective ratios of said lithium-based adduct, and

wherein said polymerization initiator is the adduct reaction product of a hydrocarbon lithium compound with a monohydroxyalkyl-substituted conjugated alkadiene is represented by the formula:



(I)

wherein R is hydrogen or a monohydroxyalkyl group such that (I) contains a single monohydroxyalkyl group, and wherein said (I) contains 5 to 10 carbon atoms per molecule.

4,044,196

CROSSLINKED COPOLYMERS OF α,β-OLEFINICALLY UNSATURATED DICARBOXYLIC ANHYDRIDES

Fritz Hüper; Erich Rauenbusch; Günter Schmidt-Kastner, all of Wuppertal; Bruno Bömer, Leverkusen, and Herbert Bartl, Odenthal-Hahnenberg, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 487,437, July 11, 1974, abandoned, which is a division of Ser. No. 345,792, March 28, 1973, Pat. No. 3,910,825. This application Dec. 1, 1975, Ser. No. 636,569

Int. Cl.[2] C08F *222/04, 222/06*

U.S. Cl. 526—271 **3 Claims**

1. A crosslinked copolymer comprising the following copolymerized units:

A. 2.0 to 20 weight percent of at least one α,β-olefinically unsaturated dicarboxylic acid anhydride having 4 to 9 carbon atoms; and

B. 80 to 98 weight percent of at least one di- and/or poly(-meth)acrylate of a diol and/or polyol.

4,044,197

THERMALLY SELF-CROSS-LINKABLE ETHYLENE/VINYL ACETATE COPOLYMERS

Hubert Wiest; Erwin Lieb, and Heinz Schafer, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Jan. 22, 1976, Ser. No. 651,610

Claims priority, application Germany, Mar. 21, 1975, 2512589; Nov. 17, 1975, 2551556

Int. Cl.[2] C08F *210/02*

U.S. Cl. 526—304 **10 Claims**

1. A thermally self-cross-linkable ethylene/vinyl acetate copolymer consisting essentially of the following monomer units:

a. from 5 to 50% by weight of ethylene,

b. from 30 to 87% by weight of vinyl acetate,

c. from 2 to 10% by weight of mono-olefinically unsaturated compound capable of copolymerizing and containing an N-methylol group selected from the group consisting of N-methylol acrylamide, N-methylol methacrylamide, lower alkanol ethers thereof, and mixtures thereof,

d. from 5 to 20% by weight of an acryl compound selected from the group consisting of alkyl acrylate and alkyl methacrylate where alkyl has from 1 to 10 carbon atoms,

e. from 0.5 to 3% by weight of an unsaturated acid selected from the group consisting of alkenoic acids having from 3 to 6 carbon atoms and alkenedioic acids having from 4 to 6 carbon atoms, and

f. from 0 to 1% by weight of a poly-olefinically-unsaturated monomer copolymerizable with vinyl acetate and ethylene, said copolymer having a glass transition temperature of between −40° and +10° C.

4,044,198

METHOD FOR COLD-MILLING CELLULOSE DERIVATIVES

Michael Kostrzewa, Wiesbaden; Arno Holst, Wiesbaden-Biebrich, and Gerhard Buchberger, Auringen, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Mar. 6, 1975, Ser. No. 556,053

Claims priority, application Germany, Mar. 7, 1974, 2410789

Int. Cl.[2] C08B *11/00*

U.S. Cl. 536—86 **3 Claims**

1. In the method for the cold-milling of a cellulose derivative, in which the cellulose derivative is cooled by means of liquid nitrogen until it becomes brittle and the thus cooled cellulose derivative is milled in a mill,

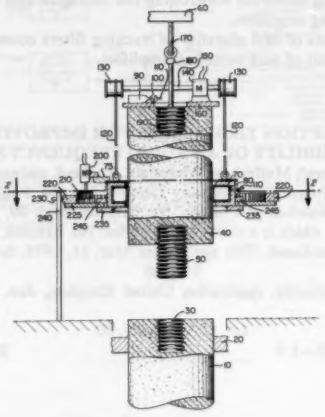
the improvement comprising cold-milling to a milled product having a high proportion of fine grain, a cellulose derivative which is soluble or swellable in water and has a water content of between 40 and 150 per cent by weight, based on its dry weight, and which is, at 20° C, able to absorb, during swelling, more than 150 per cent by weight of water, based on its dry weight.

4,044,199

APPARATUS FOR APPLYING TORQUE TO ELECTRODES

Irvin C. Simon, Kenmore, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 10, 1975, Ser. No. 585,685
Int. Cl.[2] F16H *21/12, 1/06;* H05B *7/18, 7/14*
U.S. Cl. 13—18 2 Claims



1. Apparatus for applying torque to a vertically suspended electrode section comprising a ring member surrounding the electrode section and fixedly engaged thereto; a ring gear member rotatably supported by said ring member and surrounding said electrode section; drive means fixedly supported on said ring member; a drive gear coupled to said drive means and engaging said ring gear; arresting means fixedly positioned with respect to the vertical axis of said electrode section and arranged to engage said ring gear and prevent rotation thereof upon engagement therewith whereby upon actuation of said drive means torque is applied to cause rotation of said electrode section.

4,044,200

INSULATED WIRE OR CABLE

Robert J. Turbett, Millington, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 312,134, Dec. 4, 1972, abandoned. This application Mar. 14, 1974, Ser. No. 451,113
Int. Cl.[2] H01B *7/28*
U.S. Cl. 174—23 R 4 Claims

1. Insulated wire or cable having primary insulation between copper conductor and moisture barrier filler and wherein said primary insulation comprises, based on the total weight of said insulation.

a. solid ethylene polymer having a density of about 0.928 to 0.955,

b. about 0.05 to 0.2% by weight of 3-salicyloyl-amido-1,2,4-triazole, and

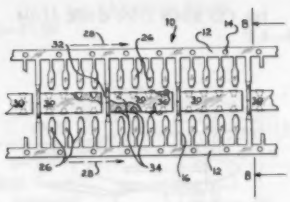
c. about 0.01 to 0.2% by weight of at least one organic compound having a molecular weight of at ≧550, and which is selected from the group consisting of compounds containing at least four hindered phenolic hydroxyl groups.

4,044,201

LEAD FRAME ASSEMBLY

Charles W. Wallick, York, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 506,760, Sept. 17, 1974. This application Oct. 6, 1975, Ser. No. 619,971
Int. Cl.[2] H05K *1/04*
U.S. Cl. 174—52 FP 8 Claims



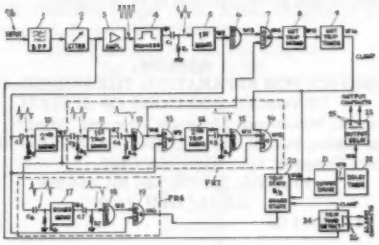
1. A lead frame assembly comprising a pair of spaced parallel carrier strips, a plurality of spaced leads extending from each carrier strip toward the other strip and arranged in opposed groups along the length of said strip, and collapsible rungs joining said strips between groups of leads, each rung including a pair of collapsible links bent up at a shallow angle from the assembly and joining each other at a shallow apex.

4,044,202

PLURAL FREQUENCY SIGNALLING SYSTEMS

Eugeniusz Antoszewski, Stafford, England, assignor to The General Electric Company Limited, London, England

Filed Dec. 29, 1975, Ser. No. 644,570
Claims priority, application United Kingdom, Jan. 21, 1975, 2571/75
Int. Cl.[2] H04L *27/14*
U.S. Cl. 178—88 11 Claims

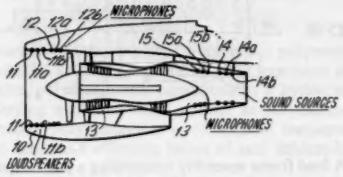


1. A receiver for use in a signalling system of the kind wherein data is conveyed by transmitting a signal having alternately first and second frequencies comprising: shaping and squaring circuitry which provides in response to the received signal first and second trains of pulses, the two trains having frequencies correspondingly dependent on the frequency of the received signal and the durations of the pulses in each being independent of the durations of the pulses in the other train and small compared with the period of the received signal; a first delay circuit fed with one of said trains of pulses; a second delay circuit fed with one of said trains of pulses; a first coincidence gate circuit having as inputs the output of the first delay circuit and said first train of pulses; and a second coincidence gate circuit having as inputs the output of said second delay circuit and said second train of pulses; the delays of the delay circuits being such that the first coincidence gate circuit produces an output substantially only when the received signal has its first frequency; and the second coincidence gate circuit produces an output substantially only when the received signal has its second frequency.

4,044,203
ACTIVE CONTROL OF SOUND WAVES

Malcolm Alexander Swinbanks, Glasgow, Scotland, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 417,636, Nov. 28, 1973, abandoned. This application Aug. 25, 1975, Ser. No. 607,462
Claims priority, application United Kingdom, Nov. 24, 1972, 54370/72
Int. Cl.² E04B 1/99; G10K 11/04
U.S. Cl. 179—1 P 10 Claims



1. A method of attenuating a sound wave propagating in a given direction along a duct through a fluid contained in the duct, the method comprising:

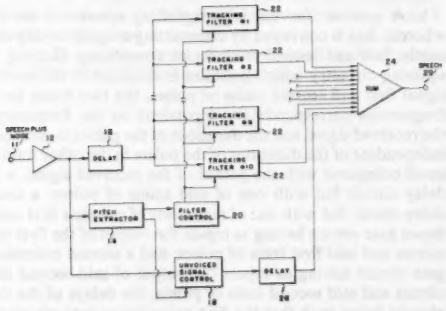
generating sound waves from an array of similar sound sources located adjacent the wall of said duct respectively at different positions along said duct, each source generating a pair of sound waves which travel through said fluid in opposite directions along said duct from the position of that source; and

controlling the operation of said array of sources to cause destructive interference to occur between the wave to be attenuated and the resultant of the waves generated by said sources and travelling in said given direction and simultaneously to cause the resultant of the waves generated by said sources and travelling in the direction opposite to said given direction to be negligible.

4,044,204
DEVICE FOR SEPARATING THE VOICED AND UNVOICED PORTIONS OF SPEECH

Howard E. Wolnowsky, Mountain View, and Erling N. Belland, San Mateo, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Feb. 2, 1976, Ser. No. 654,089
Int. Cl.² G10L 1/00
U.S. Cl. 179—1 SA 3 Claims



1. A device for separating the voiced portion of speech from voice communications comprising:

input amplifier means for amplifying the input electrical signal representative of sound,

a plurality of tracking filters operably connected to the output of said input amplifier means,

means for extracting the fundamental pitch frequency of the voiced portion of the input signal, said extraction means connected to the output of said amplifier means,

said pitch extracting means further defined as providing an output proportional to the fundamental pitch frequency, said output being operably connected to said plurality of tracking filters for controlling the tuning of said filters,

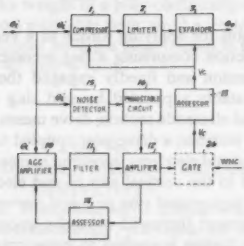
a summing amplifier,

the outputs of said plurality of tracking filters connected to the input of said summing amplifier.

4,044,205
RECEPTION TECHNIQUES FOR IMPROVING INTELLIGIBILITY OF AN AUDIO FREQUENCY SIGNAL

William Joseph Mullarkey, Whitefield, England, assignor to The Cunard Steam-Ship Company Limited, London, England

Continuation-in-part of Ser. No. 510,704, Sept. 30, 1974, abandoned, which is a continuation of Ser. No. 319,685, Dec. 29, 1972, abandoned. This application Mar. 11, 1975, Ser. No. 557,240
Claims priority, application United Kingdom, Jan. 3, 1972, 49/72
Int. Cl.² H03G 1/00
U.S. Cl. 179—1 P 25 Claims



1. A method of improving intelligibility of an audio frequency signal containing interference and wanted speech signals, including the steps of filtering the frequency band of the audio frequency signal so as to derive a narrow band section in which the interference is the least, filtering said narrow section from the remainer of the band, and generating a control signal from the derived section by using the changing value of the mean amplitude of the derived narrow section, and amplitude modulating the audio frequency signal on the basis of the control signal.

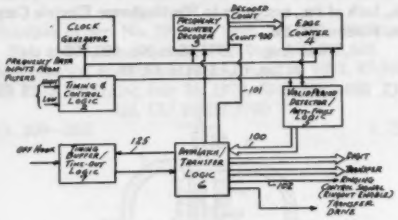
4,044,206
DIGITAL DECODER FOR MULTIPLE FREQUENCY TELEPHONE SIGNALLING

Louis W. Champan, Kent, and Arthur T. Perkins, Bellevue, both of Wash., assignors to Melco, Bellevue, Wash.

Continuation-in-part of Ser. No. 635,214, Nov. 25, 1975, abandoned. This application June 2, 1976, Ser. No. 692,122
Int. Cl.² H04M 1/50
U.S. Cl. 179—84 VF 16 Claims

1. A Touch Tone number decoder comprising means to generate clock pulses at a relatively high frequency as compared with the Touch Tone frequencies, means to derive a binary code word as a timed output for a number dialed, said binary word representing the number of said clock pulses over the intervals of time represented by the periods of the Touch Tone frequencies corresponding to the dialed number, means to store the binary word, means to compare a received binary word with a stored binary word for a plurality of consecutive times and derive a true input signal each time equality exists, shift register means arranged to fill up only in response to the

reception of successive true input signals for said plurality of successive times, means to deliver the true input signals to said shift register means, means to derive a data valid signal responsive to the filling up of said shift register means by such consecutive true input signals, and means to transmit the stored binary word responsive to a data valid signal.

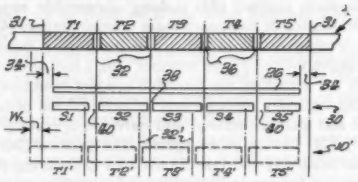


4,044,207

APPARATUS FOR REPRODUCING A MULTIPLE TRACK PHOTOGRAPHIC SOUND RECORD

Petro Vlahos, Tarzana, Calif., assignor to The Association of Motion Picture and Television Producers, Inc., Hollywood, Calif.

Filed Nov. 12, 1975, Ser. No. 630,966
Int. Cl.[2] G11B 7/20
U.S. Cl. 179—100.3 B 5 Claims



1. Apparatus for reproducing sound recorded on a film subject to film weave having a normal maximum value, said sound comprising a channel of primary sound and a channel of auxiliary sound recorded in respective adjacent variable density optical sound tracks which are laterally spaced by less than said normal maximum film weave; said apparatus comprising

means for optically scanning the sound tracks with respective sensors responsive to film areas which correspond generally to the respective sound tracks and which are laterally separated from each other by an interval larger than said track spacing and of the order of the normal maximum film weave,

said interval between areas being offset in the direction toward the track representing the auxiliary sound,

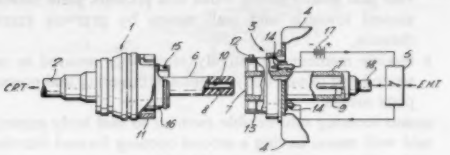
whereby in the reproduced sound any cross-talk between channels due to film weave of said normal maximum value is substantially free of sound leakage from the primary sound channel to the auxiliary sound channel.

4,044,208

TWO-PART ELECTRICAL CONNECTORS AND ELECTRICAL INTERLOCKS INCLUDING THEM

Thomas V. McDonald, Cheltenham, and Stephen D. Witts, Prestbury, both of England, assignors to Smiths Industries Limited, London, England

Filed June 9, 1975, Ser. No. 585,424
Claims priority, application United Kingdom, June 12, 1974, 26177/74
Int. Cl.[2] H01R 33/30
U.S. Cl. 200—51.09 11 Claims



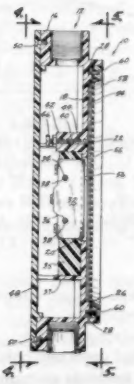
1. In a two-part electrical connector that comprises two parts each of which has an electrical contact, the two parts being engageable with one another in a mating relationship to establish electrical interconnection of the two contacts through the connector, the improvement wherein the connector further includes an elongate electrical conductor-element carried by a first of said two parts, said elongate conductor-element being in the form of a resilient-wire loop, two electrical contact-elements, and means mounting the said two contact-elements with said second part to abut the said conductor-element at spaced positions along its length, so that the two contact-elements are thereby bridged electrically by said conductor element, when the said first and second parts are engaged with one another in said mating relationship.

4,044,209

MATERIAL SENSING SWITCH

Reuben E. Peterson, Fergus Falls, Minn., assignor to Jenoff, Incorporated, Fergus Falls, Minn.

Filed Feb. 9, 1976, Ser. No. 656,352
Int. Cl.[2] H01H 35/00
U.S. Cl. 200—61.21 2 Claims



1. A material sensing switch assembly comprising,

a cylindrical body means having first and second ends,

a backing plate means removably closing said first end to define an interior compartment between said backing plate means and said wall means,

connection means for securing said body means to a support means,

said second end of said body means being closed by a wall

means having inner and outer surfaces, said wall means having a first opening formed therein,

a switch means secured to said body means within said interior compartment adjacent the inner surface of said wall means,

said switch means having a switch actuator extending outwardly through said first opening in said wall means,

a movable pressure plate means positioned at said second end of said body means at the outer surface of said wall means for engagement with said switch actuator to activate said switch means when said pressure plate means is moved towards said wall means by pressure exerted thereon,

a flexible member operatively removably secured to said second end of said body means and covering said pressure plate means,

means securing said flexible member to said body means,

said wall means having a second opening formed therein;

said wall means having a post means on its inner surface which has a longitudinal base formed therein communicating with said second opening,

an elongated spring means positioned in said base and said second opening and having one end in engagement with said pressure plate means to normally urge said pressure plate means outwardly from said wall means and said switch actuator,

and an adjustment screw means threadably mounted in said bore having one end in engagement with the other end of said spring means whereby the pressure exerted by said spring means on said pressure plate means may be selectively varied by threadable rotation of said screw means relative to said post means,

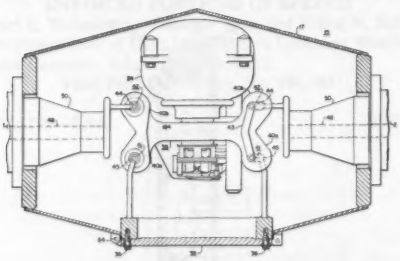
said adjustment screw means being accessible for adjustment upon removal of said backing plate means.

4,044,210

FLUID-BLAST CIRCUIT INTERRUPTER

Roswell C. Van Sickle, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 17, 1975, Ser. No. 596,792
Int. Cl.[2] H01H *33/82*
U.S. Cl. 200—148 H **9 Claims**



1. A multiple break circuit interrupter having open and closed positions, comprising:

an upstanding insulating column;

a housing supported upon said column;

a pair of terminal bushings extending into said housing;

a hollow insulating arm rotatively mounted within said housing and having two ends;

a plurality of stationary contact pairs supported within said housing;

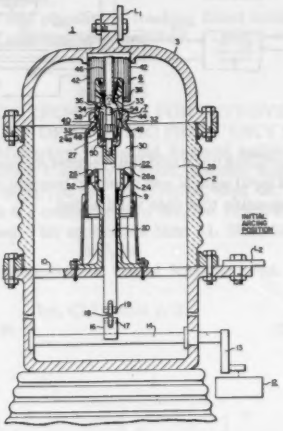
a plurality of movable contacts mounted upon each of said arm ends, each of said movable contacts being cooperable with one of said stationary contacts to establish an arc when said circuit interrupter is operated from the closed position to the open position.

4,044,211

PUFFER-TYPE COMPRESSED-GAS CIRCUIT-INTERRUPTER

Charles F. Cromer, Trafford, and Willie B. Freeman, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 7, 1975, Ser. No. 602,705
Int. Cl.[2] H01H *33/88*
U.S. Cl. 200—148 A **8 Claims**



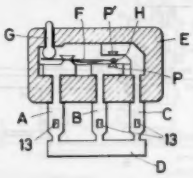
1. A puffer-type compressed-gas circuit-interrupter adaptable for high-current ratings including means defining a relatively-stationary contact structure, said relatively-stationary contact structure including a cluster of stationary main contact fingers (42) disposed in a generally cylindrical arrangement and a centrally-disposed stationary tubular arcing contact (46), means defining a cooperable movable contact structure (7), a movable operating-cylinder assembly (22) carrying said movable contact structure (7) and also an insulating nozzle, said movable operating-cylinder assembly (22) having disposed thereon adjacent its forward end an annular relatively-heavy movable main contact (44) making cooperable engagement with said cluster of stationary main contact fingers (42) in the closed-circuit position of the circuit-interrupter, means defining a relatively-fixed piston member (26), a movable operating rod (20) for actuating the movable contact structure (7) and extending centrally through said relatively-fixed piston member (26) and guided thereby, said movable operating-cylinder assembly (22) having an elongated skirt portion (24) slidable over said relatively-fixed piston member (26) during the opening operation for gas compression, said movable contact structure (7) additionally carrying a centrally-disposed movable arc horn (54) at its forward end which enters the stationary tubular arcing contact (46) in the closed-circuit position of the device, a cluster of relatively-movable arcing contact fingers (48) surrounding said centrally-disposed movable arc-horn (54) and making separable cotacting engagement with the external side of said centrally-disposed stationary tubular arcing contact (46), and arrangement functioning to first separate the main stationary and movable contacts (42, 44) followed by a subsequent separation of the cluster of relatively-movable arcing contact fingers (48) from the stationary tubular arcing contact (46) and finally a subsequent withdrawal of the arc-horn (54) from the interior of the stationary tubular arcing contact (46), gas being compressed between the movable operating cylinder and the relatively fixed piston being forced out of the movable cylinder assembly through said hollow movable insulating nozzle (33) into engagement with the established arc (34) drawn within the hollow movable nozzle (33) and between the stationary tubular arcing contact (46) and the movable contact probe (54) during the opening operation of the device.

4,044,212

ELECTRIC SWITCHES AND PROCESS AND APPARATUS FOR MANUFACTURE THEREOF

Tetsuo Takano, Tachihongo 446, Yatsuomachi, Nei, Toyama, Japan

Continuation of Ser. No. 399,681, Sept. 24, 1973, abandoned.
This application Sept. 22, 1975, Ser. No. 615,600
Claims priority, application Japan, Sept. 26, 1972, 47-96402; Apr. 26, 1973, 48-51324; July 24, 1973, 48-82680
Int. Cl.[2] H01H *3/00*
U.S. Cl. 200—283 1 Claim



1. An electrical switch comprising:

a first terminal of conductive material having an elongated portion and an end portion, the end portion having first and second indentations therein on opposite sides thereof to serve as a spring support,

a second terminal of conductive material disposed adjacent to the first terminal and having an elongated portion and an end portion, the end portion having a groove therein,

an electrical contact disposed within the groove of the second terminal to be flush with the second terminal and not to project therefrom,

a third terminal of conductive material disposed adjacent to the second terminal and having an elongated portion and an end portion, the end portion having a groove therein,

an electrical contact disposed within the groove of the third terminal to be flush with the third terminal and not to project therefrom,

the end portion of the third terminal being disposed opposite to the end portion of the second terminal so that the electrical contact of the second terminal is disposed opposite to the electrical contact of the third terminal,

an elongated leaf spring having outer and inner integrally formed portions with an opening therebetween having the first terminal passing therethrough,

one end of the inner spring portion being disposed within the first indentation of the first terminal and an internal end of the outer spring portion being disposed within the second indentation of the first terminal,

an electrical contact disposed at an end of the leaf spring so as to lie between the contact of the second terminal and the contact of the third terminal,

a push rod disposed to abut the end of the leaf spring opposite to the end having the electrical contact to move the electrical contact between the contacts of the first and second terminals,

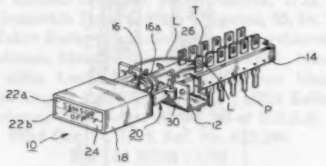
a switch case for receiving the push rod, the first, second and third terminals and the leaf spring comprising first, second and third grooves for receiving the elongated portions of the first, second and third terminals, a stepped portion for immobilizing the first, second and third terminals, a groove for receiving the push rod and permitting movement thereof in only two opposite directions and a cavity to permit movement of the leaf spring.

4,044,213

PUSH-BUTTON SENSOR SWITCH

Dwayne R. Kinney, Minnetonka, Minn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed July 28, 1976, Ser. No. 709,328
Int. Cl.[2] H01H *9/16*
U.S. Cl. 200—308 12 Claims



1. A push-button sensor switch comprising, in combination:

a switch body having a frame in which a switch plunger is slidably mounted for reciprocal movement to operate at least one set of contacts mounted to said frame;

a housing attached to the outer end of said plunger for reciprocal movement therewith and said housing having a viewing portion at its outer end;

a fixed member attached to said frame and extending into said housing, said member having a forward portion including a surface area visible through said viewing portion of said housing wherein said forward portion is alternately positioned adjacent to and spaced apart from said viewing portion in response to the reciprocal movement of said housing;

a sensor having a pair of electrodes, said sensor being mounted on said forward portion of said fixed member whereby the distance between said electrodes and said one set of contacts is fixed;

at least one shutter member rotatably mounted within said housing adjacent said viewing portion, and said shutter engaging said fixed member for rotation between first and second positions in response to relative movement between said fixed member and said housing wherein said shutter exposes said sensor when said fixed member is adjacent said viewing portion and wherein said shutter conceals said sensor when said fixed member is spaced apart from said viewing portion; and

means electrically coupling said electrodes with said one set of contacts to control the output of said sensor in response to movement of said housing.

4,044,214

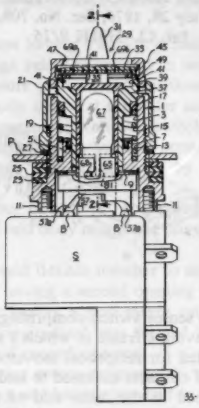
ILLUMINATED TWO-COLOR SELECTOR SWITCH

Donald Lee Rayburn, Asheville, N.C.; Larry Ray Sunday, Brown Deer, and Edgar Robert Larsen, Milwaukee, both of Wis., assignors to Square D Company, Park Ridge, Ill.

Filed Mar. 23, 1976, Ser. No. 669,548
Int. Cl.[2] H01H *9/00*
U.S. Cl. 200—316 9 Claims

1. In an illuminated selector switch operator comprising a base member having an axial passage, a rotor rotatably received in the axial passage and drivingly connected to a switch operating means for operating a switch in relation to at least two rotated positions of the rotor, the rotor having an axial passage coaxial with the axial passage of the base, the passages being open at their common ends, a light source removably mounted in the passage of the rotor, and an operating knob removably connected to one of the open ends of the rotor for effecting rotation of the rotor and the knob to the two rotated positions, the improvement comprising a lamp shield removably mounted and fixedly received in the passage of the rotor around the light source and having an aperture in an otherwise closed end for directing light from the light source toward the knob, and the knob having at least two translucent portions

one of which is positioned to be in alignment with the aperture in a first rotated position of the knob and the other of which is positioned to be in alignment with the aperture in a second rotated position of the knob.

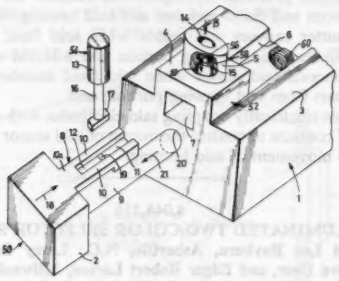


4,044,215

ELECTRIC SWITCH CONSTRUCTION HAVING AN EXTERNAL LOCKING MECHANISM

Paul Leibinger, Rietheim; Reinhold Mesle, Aldingen; Arnold Methner, Rietheim, and Alfons Steidle, Spaichingen, all of Germany, assignors to J. and J. Marquardt, Rietheim, Germany

Filed Mar. 6, 1975, Ser. No. 555,825
Claims priority, application Germany, Mar. 7, 1974, 2410871
Int. Cl.² H01H *13/02*
U.S. Cl. 200—318 **8 Claims**



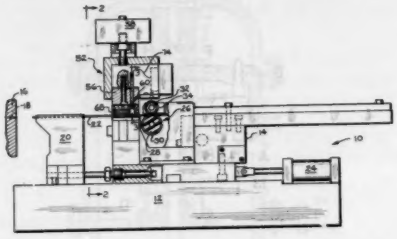
1. A switch, comprising a closed switch housing adapted to contain the switch contacts and having a guide bore extending into said housing, a switch operating member having a shaft portion movable in the guide bore between at least two operating first and second positions one of which being an operative position of the switch contacts, an operating member lock including a lock housing associated with said switch housing having a lock guide channel and a lock member bore intercepting said guide channel, a lock member movable in the bore, and a lock actuator connected to said switch operating member and displaceable in the lock guide channel, said lock member being engageable with said lock actuator when said switch operating member is in a predetermined one of said first and second positions to lock said lock member and said switch operating member against movement, said switch actuating member including a push button portion connected to said shaft portion, said lock actuator including a portion extending from said push button substantially parallel to said shaft portion and engageable in said guide channel.

4,044,216

MULTIPLE ELECTRODE ELECTRICAL DISCHARGE MACHINING

John M. Check, Chelsea, and Gary F. Rupert, Ann Arbor, both of Mich., assignors to Raycon Corporation, Ann Arbor, Mich.

Filed Feb. 27, 1976, Ser. No. 662,025
Int. Cl.² B23P *1/08*
U.S. Cl. 219—69 E **11 Claims**



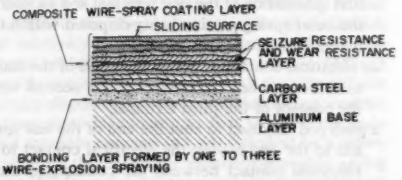
1. In electrical discharge machining apparatus for machining a workpiece wherein a plurality of generally parallel electrodes are moved during machining and during refeed in generally parallel paths, means for refeeding said electrodes to compensate for erosion thereof during maching comprising a drive roller assembly, said assembly consisting of a plurality of rollers arranged on opposite sides of said electrodes and having said electrodes drivingly engaged therebetween, means for rotating the rollers in said roller assembly so as to refeed said electrodes toward engagement with said workpiece, said rollers being operable to slip on any of said electrodes that are engaged with said workpiece during refeeding of other of said electrodes toward engagement with said workpiece, and means providing for termination of said roller rotation only in response to engagement of all of said electrodes with said workpiece.

4,044,217

SLIDING SURFACE WORKING METHOD USING WIRE-EXPLOSION COATING

Yukio Otsuki; Hiroyuki Matsumoto, both of Akashi; Hiroshi Ito, Dazaifu, and Shusuke Takezaki, Fukuoka, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe and Nippon Tungsten Co., Ltd., Fukuoka, both of Japan

Filed May 7, 1975, Ser. No. 575,169
Int. Cl.² B23K *9/04*
U.S. Cl. 219—76 **10 Claims**


COMPOSITE WIRE-SPRAY COATING LAYER
SLIDING SURFACE
SEIZURE RESISTANCE AND WEAR RESISTANCE LAYER
CARBON STEEL LAYER
ALUMINUM BASE LAYER
BONDING LAYER FORMED BY ONE TO THREE WIRE-EXPLOSION SPRAYING

1. A method of forming an improved surface in the cylinder of an internal combustion engine comprising the steps of wire-explosion spray coating the inner surface of an aluminium alloy cylinder by using wire material selected from the group consisting of molybdenum wire, molybdenum-tungsten alloy wire and tungsten wire to form a bonding layer; alternately forming on said coating surface a layer which is formed by wire-explosion spraying a carbon steel wire to reinforce the sliding sur-

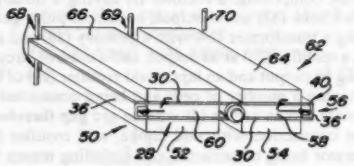
face and a layer which is formed by wire-explosion spraying a wire of a material having good seizure resistance and wear resistance characteristics; and grinding and finishing the miltilayer-coated inner surface formed by the foregoing steps.

4,044,218

DIMENSIONALLY STABLE ANODE AND METHOD AND APPARATUS FOR FORMING THE SAME

Richard O. Olson, Parma, and Gerald R. Pohto, Mentor, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 514,143, Oct. 11, 1974, Pat. No. 3,981,790, which is a division of Ser. No. 368,843, June 11, 1973, Pat. No. 3,895,210. This application Sept. 2, 1976, Ser. No. 719,820
Int. Cl.[2] B23K *11/10*
U.S. Cl. 219—91 6 Claims



1. A method of forming a dimensionally stable anode for use in an electrolytic cell comprising the steps of:

a. providing first and second sheets, each sheet having a major, generally planar, extent terminating in first and second edge portions, the second edge portion of each sheet comprising an integral leg portion bent to extend laterally from said planar extent and terminating in a tab portion extending generally parallel to said planar extent;

b. providing a generally cylindrical anode riser member;

c. positioning said pair of sheets in generally parallel relationship with the tab portion of the second edge portion of each sheet being parallel to, and in engagement with, the first edge portion of the other sheet and positioning said riser member to extend generally parallel to said first and second edge portions and between the major planar extent of said sheets to form an anode assembly;

d. placing rigid platen members within the assembly to extend between the planar extents of the two sheets and between the leg portions and the riser member;

e. clamping the assembly between rigid, planar, external platens positioned to leave exposed the first and second edge portions of each sheet and the external portions of the major planar extent of each sheet adjacent the riser; and, thereafter,

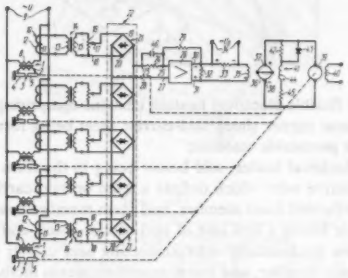
f. joining the sheets to the riser and the second edge portion of each sheet to the first edge portion of the other sheet by welding.

4,044,219

METHOD AND APPARATUS FOR CONTROLLING FLASHING SPEED DURING RESISTANCE BUTT WELDING

Vladimir Konstantinovich Lebedev, ulitsa Engelsa, 25, kv. 12; Ivan Alexeevich Chernenko, ulitsa Vladimirskaya, 98/3, kv. 45, both of Kiev; Nikolai Ivanovich Postolaty, ulitsa K. Marxa, 68, kv. 45, Kakhovka Khersonskoi oblasti; Sergei Ivanovich Kuchuk-Yatsenko, ulitsa Filatova, 1/22, kv. 47; Vladimir Ivanovich Tishura, ulitsa Chigorina, 55, kv. 27, both of Kiev; Yakov Borisovich Entin, ulitsa Chernyakhovskogo, 3, kv. 5, Kolomna Moskovskoi oblasti; Alexandr Nikolaevich Filippov, ulitsa Lenina, 42, kv. 52, Kolomna Moskovskoi oblasti, and Evgeny Petrovich Martynov, ulitsa Kalinina, 24, kv. 47, Kolomna Moskovskoi oblasti, all of U.S.S.R.

Filed Oct. 14, 1975, Ser. No. 622,394
Int. Cl.[2] B23K *11/04*
U.S. Cl. 219—100 3 Claims



1. A method for controlling flashing speed during resistance butt welding comprising measuring values of flashing current density for at least two joints of parts being welded; converting said values of current density into at least two d-c voltages and detecting the maximum value of said at least two d-c voltages; comparing said maximum d-c voltage to a preset d-c voltage, said preset voltage being proportional to a current within an admissible range of variation of the flashing current; determining a time derivative of said maximum value of said d-c voltage and using the resultant difference value between said maximum and preset voltage concurrently with said time derivative of said maximum value as parameter for controlling the flashing speed of said two joints.

4,044,220

RESISTANCE WELDING ELECTRODE AND METHOD OF MAKING

Michael A. Glagola, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Sept. 15, 1975, Ser. No. 613,611
Int. Cl.[2] B23K *11/30*
U.S. Cl. 219—119 33 Claims

1. A method for forming work-contacting layer on a surface portion of a copper or copper-base alloy body member of a resistance welding electrode, which comprises the steps of:

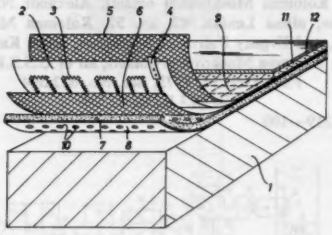
a. shot-peening said surface portion of said body member and

b. coating said surface portion of said body member with a material selected from the group consisting of nickel, berylium, cobalt, iron and high melting point alloys of the foregoing.

4,044,221
FLEXIBLE HEATING ELEMENT FOR HEATING SEATS, IN PARTICULAR MOTOR VEHICLE SEATS, COUCHES, BERTHS OR THE LIKE

Gerald Kuhn, Evenhausen, Germany, assignor to Kommanditgesellschaft Warmetechnik B. Ruthenberg GmbH, Germany

Filed May 15, 1975, Ser. No. 577,635
Claims priority, application Germany, July 19, 1974, 7424704
Int. Cl.[2] H05B 1/00
U.S. Cl. 219—217 10 Claims

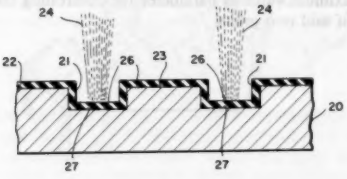


1. A flexible electrical heating element comprising:
a planar carrier sheet, said carrier sheet being formed of an air permeable material;
an electrical heater, said heater being in the form of a conductive wire which defines a seam on said carrier sheet;
a perforated foam member, said foam member having a first side facing a first side of said carrier sheet; and
means mechanically interconnecting said carrier sheet and foam member, said interconnecting means including closing seams.

4,044,222
METHOD OF FORMING TAPERED APERTURES IN THIN FILMS WITH AN ENERGY BEAM

Ami Kestenbaum, East Windsor Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jan. 16, 1976, Ser. No. 649,766
Int. Cl.[2] B23K 9/00
U.S. Cl. 219—121 LM 9 Claims



1. A method of forming a tapered aperture in an outer surface of a thin film machinable by an energy beam, the thin film having a thickness X and thermal and optical characteristics such that a temperature gradient is establishable between the outer surface of the thin film and an inner surface thereof upon impingement of the beam on the outer surface, which method comprises:
impinging the beam on a selected site on the outer surface in a series of pulses, each having a duration less than τ, where

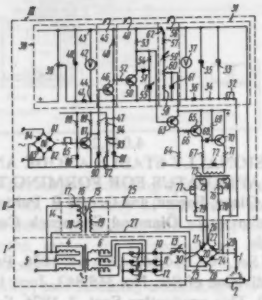
$$\tau = X^2/4K_{td} = (X^2C_p\rho)/(4k_{tc}),$$

and where K_{td} is the coefficient of thermal diffusivity of the film material, C_p is the specific heat of the film material, τ is the density of the film material, and k_{tc} is the coefficient of thermal conductivity of the film material, whereby each pulse terminates before said temperature gradient is zero, so as to form a tapered aperture of a desired depth.

4,044,223
APPARATUS FOR PULSED ARC WELDING AND BUILDING-UP OF ARTICLES

Boris Evgenievich Paton, ulitsa Kotsjubinskogo, 9, kv. 21; Vladimir Konstantinovich Lebedev, ulitsa Engelsa, 25, kv. 12; Pavel Petrovich Sheiko, prospekt Nauki, 86/90, korpus 3, kv. 16; Mikhail Petrovich Pashulya, ulitsa Konstantinovskaya, 61, kv. 11, and Boris Antonovich Steblovsky, ulitsa Anri Barbjusa, 22/26, kv. 122, all of Kiev, U.S.S.R.

Filed Apr. 8, 1975, Ser. No. 566,048
Int. Cl.[2] B23K 9/10
U.S. Cl. 219—135 6 Claims



1. An apparatus for pulsed arc welding and building-up of articles, comprising: a rectifier (I) having a three-phase input and a choke (13) at its output; a current pulse generator (II) having a transformer (14) with a primary (18) and a secondary (19), a rectifier (20) at its output, and a control circuit (III) also having an output and an input; said rectifier (20) of said generator having a number of cells and being connected to an electrode (1) and an article (2) with an arc gap therebetween, in a series connection with said choke, said rectifier (20) of said generator being constructed and including means for producing a welding current which flows continuously, having a preset threshold value, from said choke through said arc gap, irrespective of the state of said cells of the rectifier; said electrode and article being connected to said input of the control cirucit, whose output is connected to control electrodes (at 21, 22) in the rectifier (20) of said current pulse generator.

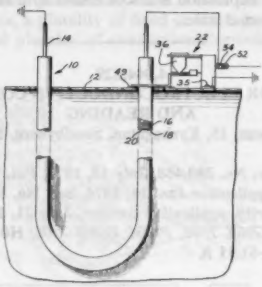
4,044,224
PROTECTIVE CIRCUIT FOR DISHWASHER HEATING ELEMENT

Thomas E. Jenkins, and LeRoy J. Herbst, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Mar. 1, 1976, Ser. No. 662,550
Int. Cl.[2] H05B 1/02; F24H 1/22
U.S. Cl. 219—322 4 Claims

1. A protective circuit for a heating element in an automatic dishwasher which includes:
an electrical resistance-type heating element connected in an electric power circuit and encased in a ceramic-filled metallic sheath;
conductive first and second supports confining a switch means and electrically connected by a fusible link, said first support being electrically attached to said sheath and said fusible link being a current-carrying link in a grounding circuit from said sheath to ground; further, said switch means being a normally-open switch in the electric power circuit of the resistance-type heating element, the protective circuit being further defined in that said fusible link maintains said normally-open switch in the closed position

until current caused by an electric arc passing from said heating element to said sheath through said link to ground, melts said link and allows said switch to move to its nor-



mally-open position, thereby simultaneously opening the ground circuit to terminate the passage of said electric arc and cutting off the power to said heating element.

4,044,225

ELECTRICAL HEATING ELEMENT AND FITTING ASSEMBLY

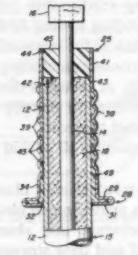
James F. Pease, 5805 Folkestone Drive, Dayton, Ohio 45459

Division of Ser. No. 640,737, Dec. 15, 1975, which is a division of Ser. No. 454,291, March 25, 1974, Pat. No. 3,930,140, which is a continuation-in-part of Ser. No. 334,002, Feb. 20, 1973, Pat. No. 3,800,415, which is a division of Ser. No. 244,516, April 17, 1972, Pat. No. 3,732,398, which is a continuation-in-part of Ser. No. 194,742, Nov. 1, 1971, abandoned. This application Jan. 3, 1977, Ser. No. 756,321

The portion of the term of this patent subsequent to May 8, 1990, has been disclaimed.

Int. Cl.[2] F24H *1/00*; H05B *1/00*

U.S. Cl. 219—336 **8 Claims**



1. In an electrical heating element assembly for mounting within spaced openings of a liquid heating vessel, and including an elongated tubular sheath having opposite end portions, and elongated electrical resistance element positioned within the sheath with a thermally conductive insulation material, and terminal members extending from end portions of the resistance element through the corresponding end portions of the sheath, the improvement comprising a pair of tubular sheet metal fittings each having a flange portion projecting outwardly from a tubular wall portion, said tubular wall portion of each said fitting having a helical convoluted thread portion with a corrugated wall configuration in axial cross-section, each said fitting having axially spaced first and second annular wall portions engaging said sheath at axially spaced locations, and a bonding and sealant material confined within the space defined between said tubular wall portion of each said fitting and said sheath and between said axially spaced first and second corresponding annular wall portions.

4,044,226

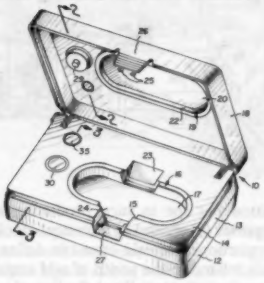
APPARATUS FOR DISINFECTION OF HYDROPHILIC CONTACT LENSES

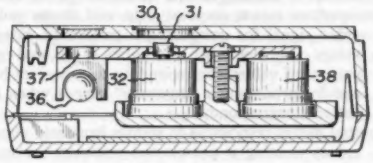
John Kadlecik, Macedon, and Wayne R. Manning, Victor, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation-in-part of Ser. No. 597,125, July 18, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 718,729

Int. Cl.[2] A61L *3/00*; F24C *1/16*

U.S. Cl. 219—521 **14 Claims**





1. A hydrophilic contact lens disinfecting device for disinfecting contact lenses carried within a contact lens carrying case comprising in combination, means defining a housing having a base and a cover, said cover and said base being movable relative to each other, a well member received within said housing, said member adapted to receive a lens carrying case, said well member and said cover cooperating to define a compartment, means for heating said well member to a predetermined temperature, manual reset thermostat means for actuating said heating means and subsequently thermostatically deactivating said heating means upon said well member obtaining the predetermined temperature and substantially prior to the completion of a disinfecting cycle, said well member having a specific heat of from 0.09 to about 0.11 BTU/lb_mF° and a density of from about 445 to about 560 $lb_m/ft.^3$ whereby the heat transferred from the well to the contact lens carrying case received therein is sufficient to destroy pathogenic microorganisms contaminating a contact lens contained in the case.

4,044,227

BAR CODE READER

James P. Holm, Kalamazoo, and Ronald J. Dudley, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 7, 1975, Ser. No. 602,777

Int. Cl.[2] G06K *7/12*; H04N *7/00*; G06K *19/06*; B07C *5/34*

U.S. Cl. 235—61.7 R **24 Claims**

3. A bar code reading system including a bar code emplaceable on an article, the bar code having an acquisition bar followed by a succession of uniform data spaces occupiable by a pattern of data bars to encode information characters, the system comprising:

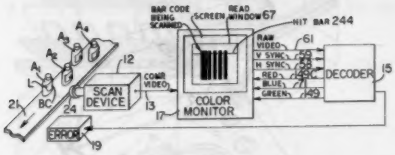
scanning means for line canning said bar code and producing

a video signal having transitions corresponding to transitions between bars and spaces of the scanned bar code;

decoder means responsive to said video signal and synchronized with said scanning means for identifying the bar code on the article being scanned, said decoder means including

a source of clock pulses of fixed frequency independent of transitions in said video signal,

strobe pulse means including means for counting clock pulses produced as said scanning means scans across said acquisition bar to establish a clock pulse count proportional to the width of said acquisition bar, and means responsive to said count and subsequent clock pulses produced after said scanning means leaves said



acquisition bar for in turn producing a sequence of strobe pulses (1) spaced by identical clock pulse quantities proportioned to said count to define uniform time intervals related to the width of said acquisition bar and (2) occurring substantially as the line of scan crosses the centers of successive data spaces of the bar code,

comparison means responsive to said strobe pulses and video signal for comparing a pattern of video signal values coincident with said pulses to a stored reference pattern of values corresponding to a correct bar code and for producing a "compare" output when the two patterns correspond,

output means responsive to signals from said comparison means meeting a preselected criterion for indicating whether the scanned bar code is a correct one.

4,044,228

ELECTRONIC CALCULATOR WITH PRINTER

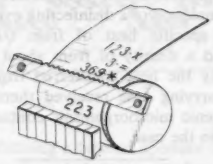
Jyuji Kishimoto, Tokyo, and Shigeru Toyomura, Kawasaka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 26, 1975, Ser. No. 608,019

Claims priority, application Japan, Aug. 30, 1974, 49-99685; Aug. 30, 1974, 49-99686

Int. Cl.[2] B41J *15/00*; G06F *7/38*; G01D *15/10*; B41J *27/00*

U.S. Cl. 235—61.9 A **10 Claims**



4. Electronic apparatus of the type including a printer for recording information on a recording medium, comprising:

key input means including numerical keys and an operation command key for depression to produce corresponding key signals;

control means coupled to said key input means for controlling operations and printing by said apparatus in response to the key signals from said key input means; and

feed drive means coupled to said operation command key and said control means, said feed drive means including a memory arranged to assume a first state during depression of said operation command key and a second state at a predetermined time after said depression is discontinued,

wherein said feed drive means is operative to continuously advance said recording medium past said printer when said memory is in said first state, and to feed a predetermined length of said recording medium past said printer after said depression is discontinued until said memory is in said second state.

4,044,229

DEVICE FOR ELECTROCONDUCTIVE CONNECTION AND READING

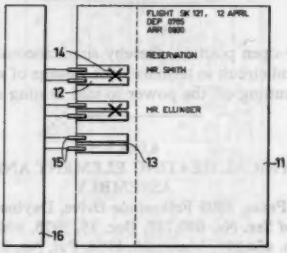
Nikolay Samreus, 15, Kyrkogatan, Sundbyberg, Sweden (S-172 32)

Division of Ser. No. 380,468, July 18, 1973, Pat. No. 3,934,120. This application Jan. 14, 1976, Ser. No. 649,076

Claims priority, application Sweden, July 21, 1972, 9601/72

Int. Cl.[2] G06K *7/06, 19/06*; G09B *7/06*; H01H *43/08*

U.S. Cl. 235—61.11 A **9 Claims**



1. A data storage retrieval memory device comprising:

a. at least one exchangeable sheet of material which is electrical substantially non-conductive and provides a plurality of data storage positions on at least one side which can individually be coded by the presence and absence of marking material which is electrically substantially conductive at said data storage positions;

b. a stationary pad on which said sheet is removably supported in overlying relationship providing a surface for carrying out said coding having first means with a plurality of electrical contacts for releaseably engaging said side of said sheet, said contacts including at least an individual one of said plurality of contacts directly contacting each of said storage positions to thereby contact any marking which may be placed thereon;

c. contact means contacting all of said positions in common; and

d. second means coupled to said plurality of contacts and said contact means providing an electrical readout device for sensing the presence and absence of said marking material at each of said data storage positions while said sheet, contacts, and contact means remain stationary with respect to each other, and said sheet is stationary on said stationary pad, said stationary relationship between said sheet, contacts, contact means and stationary pad being maintained during processing of data at all of said data storage positions on said sheet of material.

4,044,230

PERFORATED TAPE READER

Armando Costa, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Apr. 9, 1976, Ser. No. 675,382

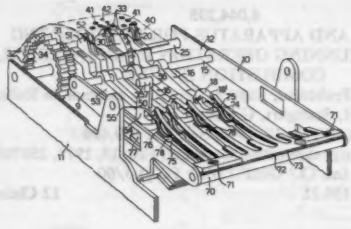
Claims priority, application Italy, May 12, 1975, 68193/75

Int. Cl.[2] G06K *7/04*; H01H *43/08*

U.S. Cl. 235—61.11 C **2 Claims**

1. A perforated tape reader comprising a plurality of detecting means associated with said perforated tape, driving means for moving said tape with respect to said detecting means, a

plurality of movable rocker arms said detecting means having means rotatably mounting at one end thereof and wherein the other end has a fork having an upper and a lower arm, a plurality of conductive elements selectively movable from a first to a second of two positions by said rocker arms for closing electric circuits, a plurality of fixed contacts located in alignment with said plurality of conductive elements, means associated with said rocker arms to normally keep said detecting means in contact with said perforated tape, whereby said conductive elements associated with said lower arms of said fork are moved away from said fixed contacts when they are in said first position and are arrested against said fixed contacts in an intermediate position between said arms of said fork when said conductive elements are in said second position in order to close said electric circuits



4,044,231

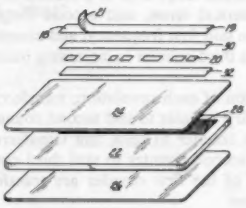
SECURE PROPERTY DOCUMENT AND METHOD OF MANUFACTURE

Charles K. Beck, Mentor, and Francis C. Foote, Rocky River, both of Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed May 27, 1975, Ser. No. 581,428

Int. Cl.[2] G06K *19/08, 7/10;* **B42D** *15/00;* **G11B** *7/00*

U.S. Cl. 235—61.12 N **15 Claims**



1. A fraud resistant document comprising:

a main body,

a plurality of radiant energy reflectors overlying said main body in a data area for reflecting incident radiant energy of predetermined characterisitcs.

a magnetic recording member overlying said radiant energy reflectors, said member being substantially transparent to said radiant energy and generally opaque to normal visible light whereby said reflectors are at least partially concealed against detection by the naked eye, and

a layer of material on the bottom of said magnetic recording member having a lower reflector-receiving surface interfacing with said reflectors, said layer of material being substantially transparent to said radiant energy and said surface having known general microtopographical characteristics,

said reflectors comprising thin elements particle deposited onto said reflector-receiving surface, each element having a reflective surface interfacing with said reflector-receiving surface and having substantially the same microtopographical characteristics as said reflector-receiving surface.

4,044,232

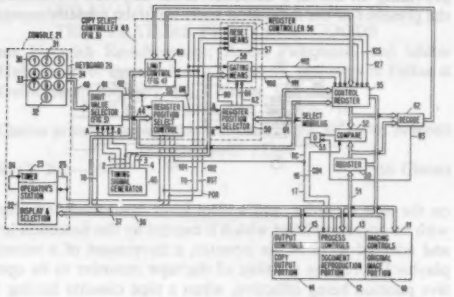
ELECTRONIC COPY SELECTION CONTROLS FOR A DOCUMENT REPRODUCTION MACHINE

James Henry Hubbard, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 23, 1976, Ser. No. 651,987

Int. Cl.[2] G06B *27/06*

U.S. Cl. 235—92 SB **33 Claims**



1. A document reproduction machine having controllable sequencing means, said sequencing means supplying signals indicating machine signal states, a keyboard for serially entering control value digit signals, each said control digit signal capable of having a value of a nonsignificant zero or one of a plurality of significant values, a control register for receiving said control digit signals, said register having a given number of signal receiving digit positions, having a given modulus and capable of assuming any one of a plurality of signal control states including a reference signal state, said machine capable of producing a number of copies of one image in one copy run in accordance with the signal contents of said control register,

the improvement including in combination electrical means electrically interposed between said keyboard and said control register, and including:

digit value selector means limiting each keyboard actuation to selecting one and only one value and for supplying value signals indicative of said selected one value;

gating means for enabling gating and shifting said value signals to predetermined digit positions of said control register;

register position indicating means indicating the number of digits in a set of significant value signals in said control register and controlling said gating means in accordance therewith;

reset means responsive to first predetermined one of said signal states to reset said control register to said reference signal state for actuating said machine to produce copy per copy run; and

position select control means responsive to a second predetermined one of said signal states to reset said register position indicating means to a reference state for enabling said keyboard to enter significant digit value signals into said control register without first separately clearing said control register.

4,044,233

END PREDICTOR FOR CASSETTE TAPE

Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 27, 1976, Ser. No. 690,539

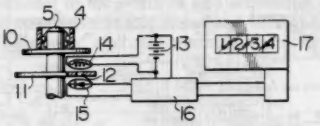
Claims priority, application Japan, June 5, 1975, 50-68024; June 10, 1975, 50-69968; June 10, 1975, 50-69969; Sept. 10, 1975, 50-109732

Int. Cl.[2] G06M *3/02*

U.S. Cl. 235—92 PE **4 Claims**

1. A tape end predictor for a tape cassette of a tape recorder, the cassette being of a type which contains a measured length of tape corresponding to a given number of turns thereof on

one of the tape hubs which are mounted in a cassette when the tape is entirely received on said one tape hub, the tape cassette of the type being provided with an indication aperture indicative of the type of cassette, the predictor comprising a counter for counting the number of revolutions of a shaft on which said one tape hub is mounted to thereby indicate the length of tape reeled off the one tape hub, alarm means responsive to a given count in the counter to close an electrical circuit, thereby providing an alarm, a detection lever disposed for detecting the presence of the indication aperture in the cassette mounted



on the tape recorder, and a reset lever operatively associated with an operating lever which is carried by the detection lever and adapted to reset the counter, a movement of a record/playback actuating member of the tape recorder to its operative position being effective, when a tape cassette having the indication aperture is mounted on the tape recorder, to reset the counter through the operating lever and the reset lever, said alarm means providing an alarm when a given count is reached in the counter, thereby predicting the tape end at a given time interval before the tape end is actually reached.

4,044,234

PROCESS AND APPARATUS FOR CONTROLLING ENGINE OPERATION NEAR THE LEAN-RUNNING LIMIT

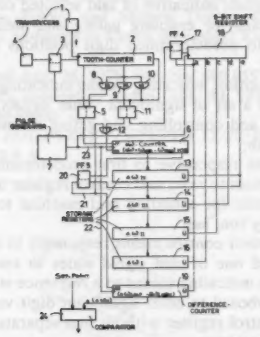
Wolf-Dietrich Frobenius, Asperg, and Hartmut Schweizer, Korntal, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 19, 1976, Ser. No. 659,493

Claims priority, application Germany, Feb. 19, 1975, 2507138

Int. Cl.[2] G06F *15/20;* F02D *5/00*

U.S. Cl. 235—150.21 **10 Claims**



1. A process for obtaining a signal for controlling an internal combustion engine, said engine including a rotating crankshaft, and cyclically moving piston means, comprising the steps of:

obtaining a first datum related to the speed of rotation of said crankshaft at a first angular position and obtaining a second datum related to the speed of rotation of said crankshaft at a second angular position;

forming and storing a first arithmetic difference between said first and second datum;

repeating the step of obtaining a first and a second datum related to the speed of rotation of said crankshaft, during a subsequent revolution thereof, and at the same position of said piston means;

forming a second arithmetic difference between the first and second datum obtained during said subsequent revolution of the crankshaft;

comparing said first difference with said second difference and obtaining a result;

comparing said result with a predetermined set-point value and obtaining a second result from which said signal for controlling the engine may be derived.

4,044,235

METHOD AND APPARATUS FOR DETERMINING SMOOTH RUNNING OPERATION IN AN INTERNAL COMBUSTION ENGINE

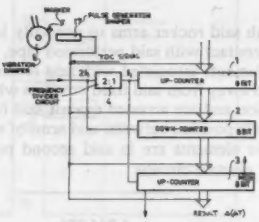
Wolf-Dietrich Frobenius, Asperg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 19, 1976, Ser. No. 659,494

Claims priority, application Germany, Feb. 19, 1975, 2507057

Int. Cl.[2] G06F *15/20;* F02D *5/00*

U.S. Cl. 235—150.21 **12 Claims**



1. A process for obtaining a signal for controlling the operation of an internal combustion engine, said engine including a crankshaft, and a fuel supply system, comprising the steps of:

measuring the period of successive crankshaft revolutions;

during each crankshaft revolution, counting a first frequency in a first counter in increasing numerical sense, counting a second frequency in a second counter in decreasing numerical sense, said second frequency being equal to twice said first frequency, and counting said first frequency in a third counter in increasing numerical sense; and

at the termination of each revolution, transferring the contents of said first counter to said second counter and resetting said first counter to zero; and transferring the contents of said second counter to said third counter before the contents of the first counter are transferred to the second counter.

4,044,236

METHOD AND APPARATUS FOR CONTROLLING THE OPERATION OF AN INTERNAL COMBUSTION ENGINE

Valerio Bianchi, Hochdorf; Peter Schmidt, Schwieberdingen, and Reinhard Latsch, Vaihingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 19, 1976, Ser. No. 659,538

Claims priority, application Germany, Feb. 19, 1975, 2507137

Int. Cl.[2] G06F *15/20;* F02D *5/00*

U.S. Cl. 235—150.21 **12 Claims**

1. A method for obtaining a signal for controlling the operation of an internal combustion engine, said engine including a rotating crankshaft, comprising the steps of:

sensing the rotation of the crankshaft and generating a first signal representative of the irregularities of crankshaft motion;

deriving a pulse signal from said first signal;

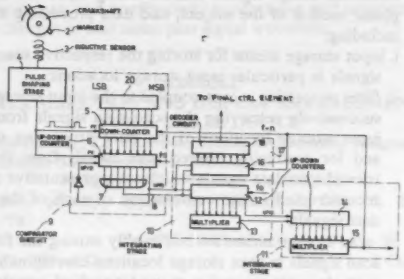
generating a second signal representative of a regularly rotating crankshaft;

performing a phase comparison between said first signal and said second signal;

generating a second pulse train of variable frequency from the twice-integrated results of said phase comparison;

applying said second pulse train to the counting input of a down counter circuit;

gating said down counter circuit by the first pulse train of a frequency substantially less than that of said second pulse train;



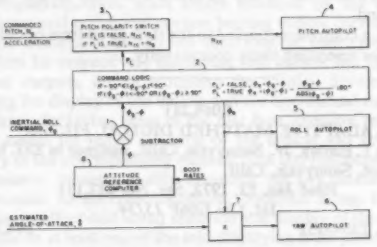
supplying the contents of said down counter circuit to the jam of an up-down counter and gating said up-down counter by said first pulse train for counting at a constant system clock frequency; thereby performing said phase comparison and generating a datum whose duration is proportional to changes in the period of rotation of the crankshaft.

4,044,237

MISSILE MANEUVER CONCEPT

Paul N. Cowgill, Bellevue, Wash., and John L. Pearson, Fountain Valley, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 16, 1976, Ser. No. 667,819
Int. Cl.[2] G06F *15/50*; F42B *15/02*
U.S. Cl. 235—150.27 **2 Claims**



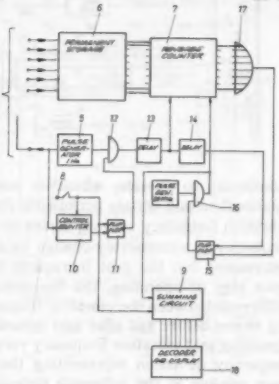
1. A system for controlling a missile having a lifting body configuration comprising a pitch autopilot having an input; a roll autopilot having an input; a yaw autopilot having an input; a pitch polarity switch having an output connected to the pitch autopilot input; logic device having first and second input and an output; an attitude reference device having output which is indicative of the attitude of said missile; pitch control signal connected to an input of said pitch polarity switch; subtractor having two inputs and an output; roll command signal connected to one input of said subtractor; the output of said attitude device being connected to the other input of said subtractor; the output of subtractor being connected to said logic device whereby said logic device will set the polarity of said pitch polarity switch; said logic device further having said second output connected to said roll autopilot; said logic determining the polarity of the signal applied to said roll autopilot; a multiplier having first and second inputs and an output; and estimated angle of attack of said missile vehicle signal being fed into one input of said multiplier; said second output of said logic device being fed to the other input of said multiplier; and said output of said multiplier being connected to said yaw autopilot.

4,044,238

METHOD AND ARRANGEMENT FOR MEASURING AND EVALUATING TEMPERATURES IN TEMPERATURE PROCESSED GOODS

Hans Heinrich Emschermann; Bruno Fuhrmann, and Dieter Huhnke, all of Braunschweig, Germany, assignors to Felten & Guilleaume Carlswerk AG, Cologne, Germany

Filed Dec. 1, 1975, Ser. No. 636,710
Claims priority, application Germany, Nov. 30, 1974, 2456663
Int. Cl.[2] G06F *15/46*
U.S. Cl. 235—151.1 **10 Claims**



1. An arrangement for determining the effect of a heating and/or cooling process upon the goods being processed, the arrangement comprising, in combination, means for measuring the temperature of the goods at regular time intervals; means for storing the successively measured temperature values during the course of the measurements; means operative after completion of the process for deriving from each stored temperature value a process effectiveness value indicative of the effect of the process upon the processed goods during the respective corresponding time interval; and means for summing the process effectiveness values and generating a sum signal indicative of the effectiveness of the entire process, wherein the means for summing the process effectiveness values comprises a backward counter, means for applying successive ones of the process effectiveness values to the backward counter, and means for causing the backward counter after receipt of each successive effectiveness value to count backward to zero.

4,044,239

METHOD AND APPARATUS FOR ADJUSTING VIBRATION FREQUENCY OF VIBRATING OBJECT

Minoru Shimauchi, Hamamatsu, and Takashi Onoda, Hamakita, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 24, 1976, Ser. No. 661,020
Claims priority, application Japan, Feb. 28, 1975, 50-25330; Mar. 4, 1975, 50-25587
Int. Cl.[2] G10G *7/02*; G05B *15/00*
U.S. Cl. 235—151.3 **8 Claims**

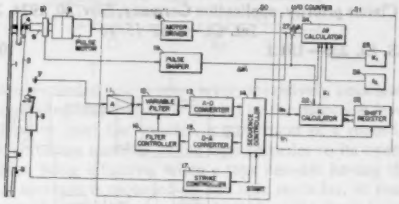
1. A method for conducting stepwise adjustment of the vibration frequency of a vibrating object by operating a vibration frequency varying means connected to said vibrating object to make said vibration frequency of said vibrating object

substantially equal to a reference frequency, comprising the steps of:

a. measuring the vibration frequency of said vibrating object;

b. operating said vibrating frequency varying means by an increment to cause the vibrating frequency to change and measuring the resulting vibration frequency of the vibrating object;

c. stopping the operating step whenever the difference between said resulting vibration frequency measured in a preceding step of operating and the reference frequency is smaller than a certain predetermined permissible frequency error;



d. continuing to operate, whenever said difference is not smaller than said certain permissible frequency error, said vibration frequency varying means to cause the vibrating frequency to successively change by a present increment determined by: the past increment in the immediately prior step of operating, the frequency representing the difference between the vibration frequencies of the vibrating object before and after said immediately prior step of operating said vibration frequency varying means, and the frequency deviation representing that frequency difference relative to the reference frequency still remaining after the immediately prior step of operating; and

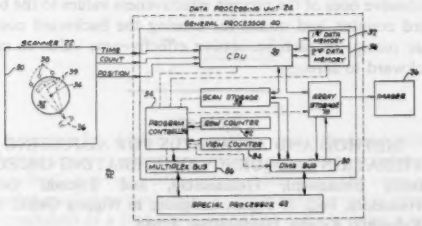
e. repeating steps (c) through (d) until the vibration frequency of the vibrating object becomes substantially equal to the frequency.

4,044,240

TOMOGRAPHY SYSTEM HAVING AN ULTRA HIGH SPEED PROCESSING UNIT

Jerome P. Cox, Jr., St. Louis, and Vernon W. Gerth, Jr., Kirkwood, both of Mo., assignors to Picker Corporation, Cleveland, Ohio

Filed Nov. 28, 1975, Ser. No. 635,953
Int. Cl.[2] G01T *1/16*; G06F *15/52*
U.S. Cl. 235—151.3 **27 Claims**



1. A transverse section tomography system for providing a reconstructed image of a planar section of a subject, comprising:

a. a movably supported radiation detector for detecting radiation which has passed through the planar section of the subject and for generating a sequence of scan data signals indicative of the intensity of the radiation after it has passed through the subject, said scan data signals being generated at predetermined orientations and positions whereby detection of the radiation at a given orientation and position defines a scan element and detection of the radiation at all predetermined orientations and positions defines a scan cycle; and,

b. data processing means responsive to the sequence of scan data signals for generating a set of repeatedly updated, elemental image signals characterizing structure of the planar section of the subject, said data processing means including:

i. input storage means for storing the respective scan data signals in particular input storage locations;

ii. filter processing means coupled to the input storage for successively retrieving the scan data signals from the input storage locations of the filter processing means and for producing filtered scan signals from the retrieved scan data signals which are representative of the reconstructed image contribution of each of the scan data signals;

iii. scan storage means for retrievably storing the filtered scan signals in scan storage locations corresponding to scan elements occurring at predetermined orientations during the scan cycle;

iv. array storage means for storing as they are generated, elemental image signals which are to be repeatedly updated; the elemental image signals being stored in array storage locations coordinated with a preselected array of points of said planar section;

v. an array storage address calculator for addressing a selected array storage location containing the elemental image signal corresponding to a selected one of said preselected points of the planar section;

vi. a scan storage address calculator for addressing the scan storage location containing the filtered scan signal corresponding to a given scan element which resulted in the detection of radiation sufficiently near said selected point to contribute to the reconstruction of the image at said selected point;

vii. updating means for combining the addressed filtered scan signal with the addressed elemental image signal to provide one of the updated, elemental image signals; and,

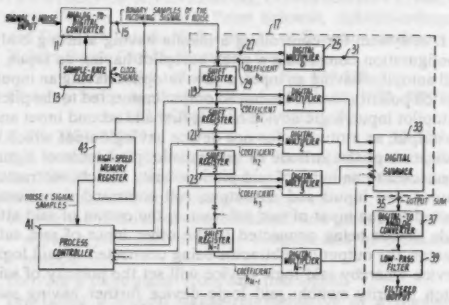
viii. a controller coupled to the storage address calculators for operating them concurrently.

4,044,241

ADAPTIVE MATCHED DIGITAL FILTER

William T. Hatley, Jr., Sunnyvale, Calif., assignor to ESL Incorporated, Sunnyvale, Calif.

Filed Jan. 12, 1972, Ser. No. 217,171
Int. Cl.[2] G06F *15/34*
U.S. Cl. 235—152 **14 Claims**



1. An electronic filter, comprising,

means receiving an electronic noise plus signal waveform for sampling said waveform at periodic intervals with the

amplitude of each waveform sample expressed in a binary code,

a digital filter receiving the binary waveform samples at an input and forming a filtered binary signal at an output, said filter having a transfer function that is controllable by application of a plurality of binary constants thereto, and

means receiving said input binary samples for automatically generating said transfer function controlling filter binary constants and continuously conforming said constants to changes in said noise plus signal waveform.

4,044,242

DATA SELECTION AND DISPLAY ARRANGEMENT FOR A SMALL DEVICE

Claude Laesser, La Chaux-de-Fonds, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Apr. 30, 1975, Ser. No. 573,264

Claims priority, application Switzerland, May 3, 1974, 6031/74

Int. Cl.[2] G04B *47/00*

U.S. Cl. 235—152 **3 Claims**

1. For use with an electronic calculator through which operations on selected numeric data are performed in accordance with selected functions after entry of the data and functions to produce operational outputs, a selector and display arrangment comprising a casing having a dial face enclosed by a peripheralportion, scale means mounted on the dial face adjacent said peripheral portion bearing indicia corresponding to the numeric data and the functions, at least two display devices for respectively displaying said indicia and the operational outputs, means mounting the display devices in the casing for display of the indicia and the operational outputs on separate displaying areas of the dial face, pressure responsive key means for initial selection of the indicia and subsequent entry of the corresponding numeric data and functions into the calculator, means movably mounting the key means for displacement to different operative positions along the scale means to effect said initial selection and display of the selected indicia on at least one of the said displaying areas prior to entry of the corresponding data and functions into the calculator, and means responsive to pressure exerted on the key means in each of said different positions thereof for said subsequent entry of the selected data and functions to effect display of the operational outputs in another of the displaying areas.

4,044,243

INFORMATION PROCESSING SYSTEM

Leon N. Cooper, and Charles Elbaum, both of Providence, R.I., assignors to Nestor Associates, Stonington, Conn.

Filed July 23, 1976, Ser. No. 707,995

Int. Cl.[2] G05B *13/02*; G06F *7/38*

U.S. Cl. 235—152 **18 Claims**

1. A digital, adaptive information processing system comprising, in combination:

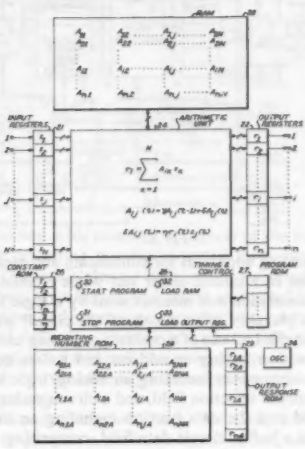
a. digital input register means for storing a plurality (N) of digital numbers $s_1, s_2 \ldots s_j \ldots s_N$, representing an input signal;

b. digital output register means for storing a plurality (n) of digital numbers $r_1, r_2 \ldots r_i \ldots r_n$, representing an output response; and

c. digital information processing apparatus connecting said input register means with said output register means, said apparatus comprising:

1. digital memory means for storing a plurality ($n \times N$) of digital weighting numbers $A_{11}, A_{12} \ldots A_{ij} \ldots A_{nN}$;

2. digital multiplier means, coupled to said input register means and to said memory means, for multiplying selected ones s_j of said numbers located in said input register means with selected ones A_{ij} of said weighting numbers to produce digital product numbers s'_j in accordance with the formula:



$$s'_j = A_{ij}s_j$$

3. digital adder means, coupled to said multiplier means and to said output register means, for adding together selected ones of said product numbers s'_j produced by said multiplier means to produce digital sum numbers r_i in accordance with the formula:

$$r_i = \sum_{j=1}^{N} s'_j$$

said sum numbers r_i being stored in said output register means; and

4. digital modifier means, coupled to said input register means, said output register means and to said memory means, for changing at least one of said weighting numbers A_{ij} in accordance with the formula:

$$A_{ij}(t) = \gamma A_{ij}(t-1) + \eta s_j r_i$$

where $A_{ij}(t)$ is the new number stored in said memory means,

$A_{ij}(t-1)$ is the number previously stored in said memory means,

γ is a decay constant in the range $o \leqq \gamma \leqq 1$,

η is a learning constant for which $o \leqq \eta$,

s_j is the number stored in said input register means,

r_i is the member stored in said output register means, and

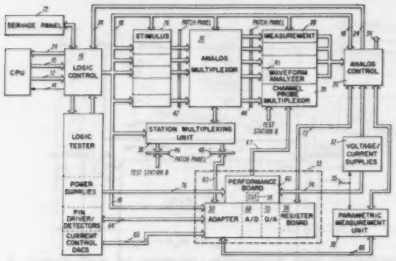
i and j are integers from 1 to n and N, respectively.

4,044,244

AUTOMATIC TESTER FOR COMPLEX SEMICONDUCTOR COMPONENTS INCLUDING COMBINATIONS OF LOGIC, MEMORY AND ANALOG DEVICES AND PROCESSES OF TESTING THEREOF

Steven H. Foreman, Manassas; Ernest H. Millham; James E. Ortloff, both of Warrenton, and Ronald Jay Prilik, Annandale, all of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 6, 1976, Ser. No. 712,303
Int. Cl.[2] G06F *11/00*; G01R *15/12*
U.S. Cl. 235—153 AC 16 Claims



1. A testing apparatus for stimulating and measuring analog properties of a circuit under test while enabling the simultaneous stimulation and measurement by a logic testing apparatus on a plurality of terminals of the circuit under test, connected to the I/O bus of a central processing unit for receiving an instruction having an address and a data component, the address component including an analog/logic selection field, an instrument selection field, and a circuit under test pin selection field and the data portion including an instrument data field and a buffer circuit data field, comprising:

an instrument decoder having an input connected to said central processing unit I/O bus;

a first testing instrument having a control input connected to an output of said instrument decoder and a second testing instrument having a control input connected to an output of said instrument decoder, said first and second testing instruments having data lines connected to said central processing unit I/O bus;

said instrument decoder generating an enabling signal to said first testing instrument in response to the receipt of a first instrument select field in a first instruction output from said central processing unit, causing said first testing instrument to generate a signal waveform on an output line, characterized by a first instrument data field in said first instruction;

said instrument decoder enabling said second testing instrument in response to the receipt of a second instrument select field in a second instruction output from said central processing unit, causing said second testing instrument to measure a second signal waveform on an input line, based upon measurement criteria specified by a second instrument data field in said second instruction;

a multiplexor having a first signal input connected to the output of said first testing instrument and a control input for receiving a component under test pin select field from said first instruction;

a first buffer circuit having an input connected to a first output from said multiplexor, which first output is connected through said multiplexor to said signal output of said first test instrument in response to a component under test pin select field in said first instruction;

a buffer circuit decoder having an input connected to said I/O bus from said central processing unit and a control input connected to said first buffer circuit, for connecting said first output from said multiplexor, through said first buffer circuit to a first terminal on said component under test in response to a buffer circuit data field in said first instruction, enabling the input of said first signal waveform to said first terminal on said component under test;

a second buffer circuit having an input connected to a second terminal of said component under test, which second terminal generates said second signal waveform which is the component under test's response to said first signal waveform;

a second buffer circuit decoder having an input connected to said I/O bus of said central processing unit and a control output connected to said second buffer circuit for connecting said second terminal of said component under test through said second buffer circuit to a second input line to said multiplexor in response to a second buffer circuit data field in said second instruction;

said multiplexor having a second output line connected to said signal input line for said second testing instrument, connected through said multiplexor to said second buffer circuit in response to a second circuit under test pin select field in said second instruction;

said second testing instrument measuring said second signal waveform generated from said second terminal of said component under test and generating a digital representation of said measurement which is output over said output line of said second testing instrument to the I/O bus of said central processing unit;

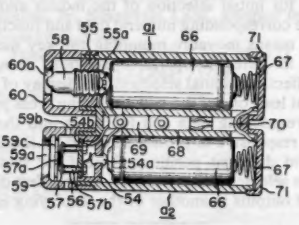
whereby a plurality of test may be performed on the component under test.

4,044,245

PORTABLE, MULTI-PURPOSE, RECHARGEABLE CIGARETTE LIGHTER

Kenichi Mabuchi, Tokyo, Japan, assignor to Mabuchi Motor Co. Ltd., Tokyo, Japan

Division of Ser. No. 413,764, Nov. 8, 1973, Pat. No. 3,934,302.
This application July 17, 1975, Ser. No. 596,808
Claims priority, application Japan, Nov. 14, 1972, 47-114183; Dec. 12, 1972, 47-124497
Int. Cl.[2] F21V *33/00*
U.S. Cl. 240—6.4 CL 1 Claim

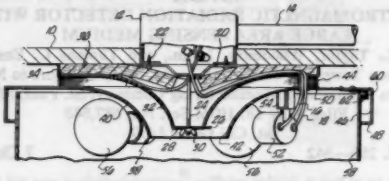


1. A portable cigarette lighter comprising laterally spaced apart first and second, side-by-side housing means defining a volume, each of said housing means being adapted to contain a rechargable battery cell, spacer means interconnecting said first and second housing means, a heating element in one of said housing means, an illuminating lamp in the other of said housing means, separate switch means for said heating element and said illuminating lamp, said switch means being located in said spacer means, and socket means in said spacer means, said socket means being electrically coupled to terminal means in said spacer means and adapted to be connected to a source of current for recharging the battery cells.

4,044,246
CEILING MOUNTED LIGHT FIXTURE

Peter J. Docimo, Northridge, and Paul L. Richey, Long Beach, both of Calif., assignors to Marvin Electric Manufacturing Company, Los Angeles, Calif.

Filed Aug. 12, 1976, Ser. No. 713,665
Int. Cl.[2] F21S *1/06, 3/06, 13/06*
U.S. Cl. 240—78 CF 9 Claims

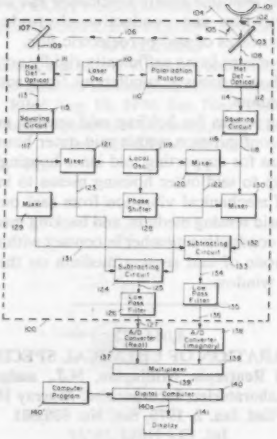


1. A light fixture to be mounted to a ceiling, comprising
a ceiling cover plate having an underside extending upwardly and outwardly from a central position to meet the ceiling when positioned thereon;
a second plate extending outwardly from a central position beneath said ceiling cover plate, said second plate having an opening therethrough;
fastening means extending between said ceiling cover plate and said second plate to hold said second plate spaced from said ceiling cover plate to define and upwardly and radially outwardly extending passageway;
light socket means positoned below said second plate outwardly of said opening.

4,044,247
POLARIZATION REFERENCE IMAGING TECHNIQUE

Wilbur P. Brown, Jr., Woodland Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 16, 1975, Ser. No. 641,329
Int. Cl.[2] H04B *9/00*
U.S. Cl. 250—199 26 Claims

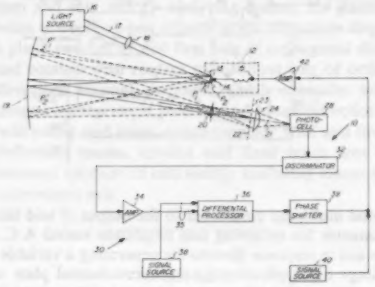


1. A polarization reference imaging system having a transmitter and receiver, said receiver having a pair of channels, comprising the combination:
a pair of squaring circuits, one of said squaring circuits as in integral part of each said channel;
a pair of mixing circuits electrically connected to each of the squaring circuits; and
a pair of subtracting circuits electrically connected to the mixing circuits.

4,044,248
METHOD AND APPARATUS FOR LINEARIZING A MIRROR GALVANOMETER

David M. Glassman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 249,922, May 3, 1972, abandoned. This application Nov. 7, 1973, Ser. No. 413,465
Int. Cl.[2] G01J *1/20;* G01R *13/38, 13/40*
U.S. Cl. 250—201 3 Claims



1. In combination with scanning apparatus of the type having a radiation deflecting member mounted for movement to scan a beam of radiation along a path, means for providing an electrical primary drive signal, and means associated with said deflecting member and responsive to said primary drive signal for moving said deflecting member in a manner effecting scan of such radiation along said path at a generally-predetermined, actual rate, a device for effecting a more precise rate of radiation scan comprising:
means, positioned along said path, for modulating such radiation to provide a radiation signal of frequency proportional to the actual rate of radiation scan along said path;
means for converting said radiation signal to a first electrical signal having a parameter that is proportional to the frequency of said radiation signal;
means for providing an electrical reference signal having a parameter which is comparable with said parameter of said first signal and which is representative of the precise rate of scan desired;
means for comparing said reference signal and said first signal and providing a correction signal proportional to the deviation of the actual scanning movement of said deflecting member from the desired scanning movement of said deflecting member; and
means for combining said correction signal with said main primary drive signal to adjust the actual scanning movement of said deflecting member.

4,044,249
VOLTAGE SUPPLY INCLUDING BILATERAL ATTENUATOR

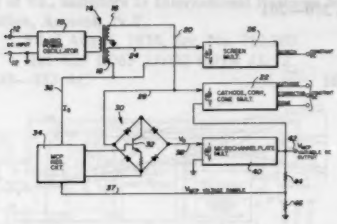
Charles E. Moore, Jr.; Sammy L. Crane, and Donald L. Lipke, all of Garland, Tex., assignors to A Division of Varo, Inc. Biometrics Instrument Corporation, Garland, Tex.

Filed Dec. 15, 1975, Ser. No. 640,687
Int. Cl.[2] H01J *39/12*
U.S. Cl. 250—213 VT 13 Claims

6. An automatic brightness control system for an image intensifier tube having a screen and a microchannel plate comprising:
a power oscillator for generating an A.C. voltage,
a first multiplier responsive to said A.C. voltage for generating at least one constant D.C. voltage for application to the screen of the image intensifier tube,
a regulator circuit including a low power oscillator for

generating a control A.C. signal and further including circuitry responsive to the screen current of the image intensifier tube for varying the amplitude of said control A.C. signal,

a bilateral attenuator for receiving said A.C. voltage and operable in response to said control A.C. signal for generating an amplitude varied A.C. voltage, and



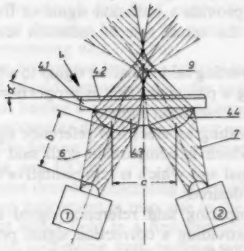
a second multiplier connected to the output of said bilateral attenuator for receiving said amplitude varied A.C. voltage and in response thereto for generating a variable D.C. voltage for application to the microchannel plate of the image intensifier tube.

4,044,250

DEVICES FOR DETECTING THE PRESENCE OF AN OBJECT IN A MONITORED REGION

Gunter Fetzer, Gundelfingen, Germany

Filed Oct. 20, 1975, Ser. No. 624,181
Claims priority, application Germany, Nov. 28, 1974, 2456248
Int. Cl.[2] H01J *3/14, 5/16, 39/12*
U.S. Cl. 250—216 **17 Claims**



1. A device for detecting the presence of an object in a region to be monitored, comprising:

light emitting means,

electronic light receiving means, and

an optical system comprising means for focussing the light emitted by the light emitting means into a bundle of light rays and means for focussing any bundle of light rays reflected by an object in the monitored region and passing same to the light receiving means,

said respective focussing means being so arranged relative to one another that the bundle of the light rays from the light emitting means and the bundle of any light rays passed to the light receiving means meet at an angle to one another to define said object region exclusively at the intersection of the most constricted cross-section areas of both said light ray bundles,

said respective focussing means being fixedly incorporated in a common block which is a nonreadily disassemble and disadjustable unitary structure consisting essentially of transparent optically refractive material which is permmeable to light,

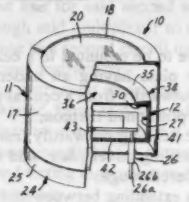
wherein said block has a plane surface as one side thereof and its opposite side includes as at least part of said focussing means two respective lens portions whose optical axes are both at an oblique angle relative to said plane surface and convergingly extend through said block for intersection at a predetermined distance outward from said plane surface at least near the center of said object region.

4,044,251

ELECTROMAGNETIC RADIATION DETECTOR WITH LARGE AREA SENSING MEDIUM

Allen L. Taylor, Woodbury, Minn., and Thomas C. Ensign, Hudson Township, St. Croix County, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 18, 1976, Ser. No. 687,543
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—342 **7 Claims**



1. A phroelectric infra-red radiation sensing device exhibiting an improved signal to noise ratio comprising:

outer housing means sealed to preclude entry of noise creating currents,

infra-red radiation transmissive window means in said outer housing means,

a pyroelectric sensing medium disposed within said outer housing means in facing relationship to said window means to directly receive infra-red radiation transmitted through said window means, said pyroelectric sensing medium having a surface area exposed to said window means of at least one square centimeter and comprising a pyroelectric film and conductive electrode means on opposing surfaces of said pyroelectric film,

said window means being sufficiently rigidly constructed to inhibit airborne acoustic oscillations from acting on said sensing medium,

inner housing means for holding said sensing medium in a stretched configuration within said outer housing means,

support means for supporting said inner housing means in a relationship to said outer housing means to inhibit transmission of mechanical vibration from said outer housing means to said sensing medium, and backing means of a low thermally conductive member in contact with the conductive electrode of said sensing medium on the side away from said window.

4,044,252

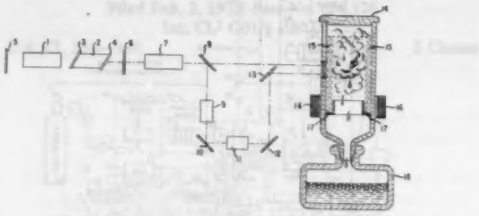
SEPARATION OF CHEMICAL SPECIES

Peter Michael Rentzepis, Millington, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 2, 1975, Ser. No. 538,081
Int. Cl.[2] H01J *39/34*
U.S. Cl. 250—282 **10 Claims**

1. Process for species separation in accordance with which a vapor containing at least two different species is irradiated so as to electronically excite but one selected species and is separated by use of an agent which has a preferential coulombic attraction for the excited species, characterized in that the said vapor is irradiated by radiation which includes a sharply defined spectral portion for exciting the selected species to an elevated vibrational state and a portion for electronically raising the energy level of the selected species in the elevated

vibrational state to an electronically elevated level in which electronic charges are separated, and in that the ambient atmosphere is substantially saturated with respect to said agent, which is a condensable vapor which is substantially a non-solvent for any included isotopic species which is not in an electrically elevated level in which electronic charges are separated, whereby the selected species serves as nucleation sites for the said condensable vapor so that the selected species selectively precipitates at such sites.



4,044,253

NON-DESTRUCTIVE INSPECTION OF COMPOSITE AND ADHESIVELY BONDED STRUCTURES

Robert L. Crane, Kettering, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 4, 1976, Ser. No. 692,840
Int. Cl.² G01N *21/16*
U.S. Cl. 250—302 **7 Claims**

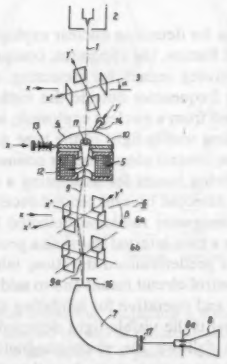
1. A method for detecting through-the-thickness flaws in composites comprising a plastic sheet or coating bonded to a metal substrate which comprises the steps of applying to the sheet or coating a solution of 8-hydroxyquinoline in a solvent therefor; and exposing the sheet or coating to ultraviolet radiation.

4,044,254

SCANNING CORPUSCULAR-BEAM TRANSMISSION TYPE MICROSCOPE INCLUDING A BEAM ENERGY ANALYZER

Burkhard Krisch, and Moriz V. Rauch, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 19, 1976, Ser. No. 715,847
Claims priority, application Germany, Aug. 28, 1975, 2538523
Int. Cl.² G01M *23/00*
U.S. Cl. 250—311 **2 Claims**



1. In a scanning corpuscular-beam transmission-type microscope including a magnetic objective lens for focusing the beam on a specimen, the total field of the objective lens helically deflecting parts of the beam not disposed in the microscope axis through an image rotation angle and rotating the image of the specimen in the microscope; first beam deflection means disposed between the source of the beam and the specimen for guiding the focused beam over the specimen in a first pair of orthogonal directions in raster-fashion; and energy analyzing means disposed behind the specimen along the beam path for analyzing the energy of the beam including an entrance aperture with a fixed input area disposed about the microscope axis; the improvement comprising:

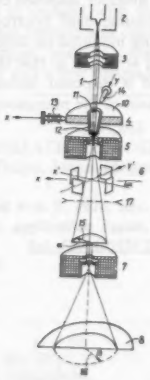
second beam deflection means disposed between said specimen and said energy analyzing means, for guiding said beam in a second pair of orthogonal directions disposed in a plane parallel to said first pair of orthogonal directions and rotated with respect to said first pair of orthogonal directions through an angle which coincides with said image rotation angle, said second beam deflection means redirecting said beam, synchronously with said first beam deflection means, toward said fixed input area of said entrance aperture of said energy analyzing means near the microscope axis.

4,044,255

CORPUSCULAR-BEAM TRANSMISSION-TYPE MICROSCOPE INCLUDING AN IMPROVED BEAM DEFLECTION SYSTEM

Burkhard Krisch, and Moriz V. Rauch, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 19, 1976, Ser. No. 715,848
Claims priority, application Germany, Aug. 28, 1975, 2538521
Int. Cl.² G01M *23/00*
U.S. Cl. 250—311 **1 Claim**



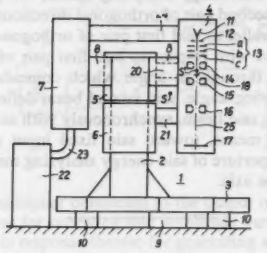
1. In a corpuscular-beam transmission-type microscope in which image elements are generated simultaneously including means for holding a specimen movable perpendicular to the microscope axis in a pair of transverse adjustment directions, beam deflection means disposed behind the specimen along the beam path for deflecting an image of the specimen in the microscope in at least one deflection direction, and magnetic lens imaging means disposed between the specimen and the beam deflection means which helically deflects, between the specimen and the beam deflection means, parts of the beam not disposed in the microscope axis and rotates the image of the specimen through an image rotation angle in the microscope, the improvement comprising said beam deflection means deflecting said beam in a pair of transverse deflection directions disposed in a plane parallel to said pair of transverse adjustment directions and rotated with respect to said pair of transverse adjustment directions through an angle coinciding with said image rotation angle.

4,044,256

SUPPORT STAND FOR A CORPUSCULAR-BEAM MICROSCOPE

Burkhard Krisch; Karl-Heinz Muller; Moriz von Rauch, all of Berlin, Germany, and Lee H. Veneklasen, San Leandro, Calif., assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 31, 1976, Ser. No. 719,140
Claims priority, application Germany, Sept. 9, 1975, 2540595
Int. Cl.[2] G01M *23/00*
U.S. Cl. 250—311 **3 Claims**



1. In a corpuscular-beam microscope including a support stand, a columnar housing containing optical elements of the microscope, an electronic control and regulating means for generating and transmitting voltage signals to parts of a beam generator of the microscope which are at high-voltage potential, and at least one high-vacuum pump for evacuating the microscope housing, the improvement comprising said support stand comprising a horizontal base member and a flexure-resistant vertical support member disposed on said base member, said microscope housing, said control and regulating means. and said pump being mounted on different sides of said support member and beng arranged so that the center of gravity of said support stand is disposed between said support member and the optical axis of the microscope near said axis.

4,044,257

RETENTION TIME CHROMATOGRAPH EMPLOYING AN IR ABSORPTION SPECTROGRAPHIC DETECTOR

Lloyd B. Kreuzer, San Francisco, Calif., assignor to Diax Corporation, Palo Alto, Calif.

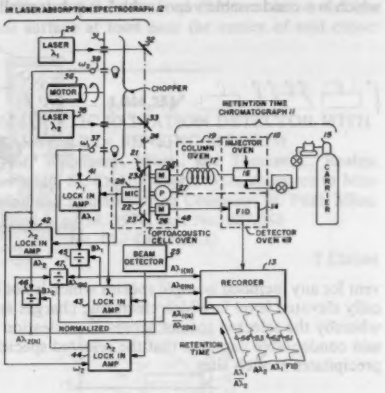
Filed Feb. 20, 1975, Ser. No. 551,379
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—344 **14 Claims**

4. The method for resolving constituents of a fluid sample including the steps of:

deriving a pair of sample absorption signals which are a function of the absorption of infrared energy by constituents of the sample material from a laser beam of infrared radiation at first and second wavelengths λ_1 and λ_2, respectively;

controlling the pressure of the fluid sample to a predetermined value in the region where the absorption signals are derived; and

deriving an output proportional to the ratio of the two sample absorption signals at λ_1 and λ_2 said output being characteristic of the constituents in the fluid sample under analysis.

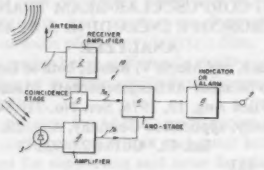


4,044,258

NUCLEAR EXPLOSION DETECTOR WITH FALSE ALARM PREVENTION

Frank Frungel, Herwigredder 105a, 2 Hamburg 56, Germany

Continuation-in-part of Ser. No. 212,429, Dec. 27, 1971, abandoned. This application Nov. 14, 1973, Ser. No. 415,617
Claims priority, application Germany, Dec. 30, 1970, 2064406
Int. Cl.[2] G01J *1/00*; G01T *1/00*
U.S. Cl. 250—336 **9 Claims**



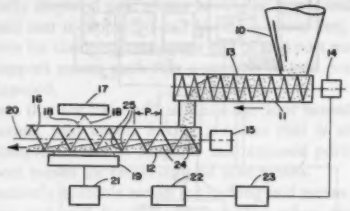
2. An apparatus for detecting nuclear explosions with a false alarm prevention feature, the apparatus, comprising, in combination, first receiving means for detecting electromagnetic radiation having frequencies outside the visible range and of the type generated from a nuclear explosion; second receiving means for detecting visible light of the type generated from a nuclear explosion; control circuit means connected to said first and second receiving means for generating a control signal if the visible light detected by said second receiving means follows the electromagnetic radiation detected by said first receiving means by a time interval less than a predetermined time interval having a predetermined duration; inhibit means connected to said control circuit means and to said first and second receiving means and operative for inhibiting the generation of said control signal if the visible light detected by said second receiving means follows the electromagnetic radiation detected by said first receiving means by a time interval less than approximately 3 microseconds, 3 microseconds constituting a predetermined minimum time delay; and output means operative for generating an alarm signal in response to generation of said control signal.

4,044,259

METHOD AND APPARATUS FOR MONITORING THE FLOW OF SOLIDS

Wayne W. Wyton, Trail, and Gerard Doeksen, Montrose, both of Canada, assignors to Cominco Ltd., Trail, Canada

Filed Feb. 2, 1976, Ser. No. 654,126
Int. Cl.[2] G01N *23/00*
U.S. Cl. 250—360 5 Claims



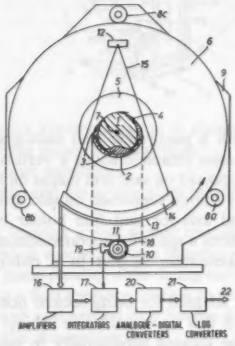
1. Apparatus for monitoring the flow of particulate solids through a screw conveyor comprising a radiation source and a radiation detector disposed about said conveyor, an amplifier and a recorder, said source and detector being placed in fixed relationship one above and one below the screw conveyor so that radiation from the source passes in a path into a bed of particulate solids moving through the conveyor and a substantial portion of said radiation, that is not absorbed or scattered by the solids or the screw conveyor, is received by the detector, said path being on the lift side of the conveyor screw, said path not being intercepted by the shaft of said screw, said detector extending parallel to the shaft of the screw for a distance at least about equal to the pitch of the screw, and said recorder receiving amplified electrical signals from said detector.

4,044,260

RADIOGRAPHY

Godfrey Newbold Hounsfield, Winthorpe, England, assignor to EMI Limited, Hayes, England

Filed Mar. 18, 1976, Ser. No. 668,045
Claims priority, application United Kingdom, Mar. 18, 1975, 11131/75
Int. Cl.[2] A61B *6/02*
U.S. Cl. 250—360 5 Claims



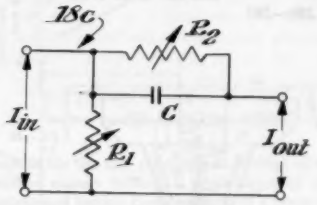
1. Radiographic apparatus including a source of a substantially planar fan shaped spread of radiation adapted to irradiate a planar section of the body of a patient, detectors sensitive to the radiation and disposed to receive radiation emergent from the body to provide output signals indicative of the intensity of the radiation received along respective paths within said spread, means for moving said source and detectors relative to said body to provide further output signals for paths at different dispositions in said section and processing circuit means for modifying said output signals to compensate, at least in part, for variations in the amplitude thereof resulting from variations in the energy spectrum of said radiation with angular position in the fan-shaped spread.

4,044,261

METHOD AND SYSTEM FOR IMPROVING THE DEFINITION OF A SCINTILLATION DETECTOR

James B. Wilson, Arlington, Va., assignor to Georgetown University, Washington, D.C.

Filed Mar. 17, 1976, Ser. No. 667,631
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—369 8 Claims



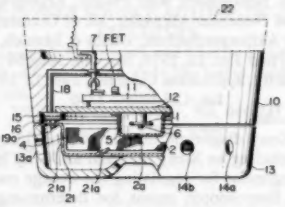
1. A system for improving the definition of a scintillation detector comprising a network connected to the detector, the network being constructed and arranged to minimize the effect of a phosphorescent afterglow in the detector, the network has an input and comprises a pair of variable resistors and a capacitor, one of the variable resistors being connected directly across and in parallel with the input, the other variable resistor being connected in parallel with the capacitor, the parallel-connected variable resistor and capacitor being connected in series with the input, and the capacitor having a relatively large capacitance and a low dissipation factor.

4,044,262

IONIZATION SMOKE SENSOR

Osami Minowa, Tokyo, Japan, assignor to Hochiki Corporation, Tokyo, Japan

Filed Feb. 5, 1976, Ser. No. 655,615
Claims priority, application Japan, Feb. 10, 1975, 50-17773
Int. Cl.[2] G01N *23/12*
U.S. Cl. 250—381 3 Claims



1. An ionization smoke sensor comprising an insulating plate, an electric sensor circuit including a field effect transistor disposed on one side of said insulating plate, a first metallic case surrounding said electric circuit and spaced therefrom, an inner electrode disposed on the opposite side of said insulating plate from said electric sensor circuit, a radiation source connected to said inner electrode, the intermediate electrode surrounding said inner electrode, a second metallic case surrounding said intermediate electrode and defining an ionization chamber therewith, said second metallic case serving as the outer electrode, means electrically connecting said first metal-

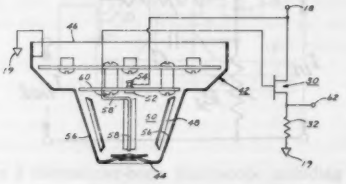
lic case and said second metallic case, and said electrodes being coupled to said sensor circuit for supplying to the field effect transistor a voltage generated across the intermediate electrode and the outer electrode when smoke enters the ionization chamber and causing the field effect transistor to produce an output signal in response to the voltage.

4,044,263

IONIZATION DUAL-ZONE STATIC DETECTOR HAVING SINGLE RADIOACTIVE SOURCE

Louis Ried, Jr., Boulder, and Arthur L. Wade, Brighton, both of Colo., assignors to Walter Kidde & Company, Inc., Clifton, N.J.

Filed Jan. 28, 1975, Ser. No. 544,818
Int. Cl.[2] G01T *1/18*
U.S. Cl. 250—381 **40 Claims**



1. A combustion product detector of the ionization chamber type comprising:

an ionization chamber having therein a relatively small reference zone and a relatively large signal zone, and further including means for allowing introduction of ambient air and products of combustion;

a source of radiation located within said ionization chamber for generating ion pairs of low density in the reference zone and of high density in the signal zone;

means comprising pairs of electrodes spaced apart across the reference and signal zones for applying voltage across and conducting current through the reference and signal zones in series, said voltage applying means being associated with the signal zone and arranged for sensing predetermined changes in voltage across the signal zone produced by products of combustion in the ionization chamber; and,

means for monitoring the voltage across the signal zone.

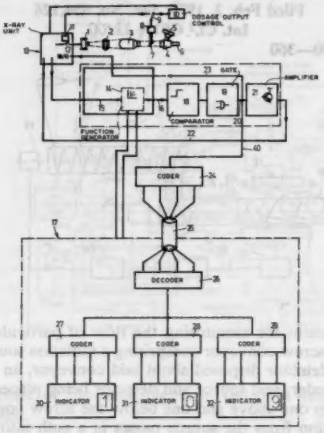
4,044,264

X-RAY DIAGNOSTIC INSTALLATION FOR RADIOSCOPY AND EXPOSURES

Herbert Lutz, Seukendorf; Rolf Pfeifer, Erlangen, and Hans Sausen, Bad Neuenahr-Ahrweiler, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 22, 1975, Ser. No. 543,054
Claims priority, application Germany, Jan. 22, 1974, 2404937
Int. Cl.[2] H05G *1/30*
U.S. Cl. 250—409 **2 Claims**

1. In an X-ray diagnostic installation for fluoroscopy and exposures including an X-ray tube and an X-ray image amplifier; an arrangement for regulating the dosage output of said tube during fluoroscopy; means for determining the tube's exposure voltage from the tube's fluoroscopic voltage; an automatic exposure timer; and a function generator receiving an input signal corresponding to the prevailing fluoroscopic voltage, said function generator generating an analog output signal from said input signal for controlling determining means for the exposure voltage, said function generator having a plurality of the exposure voltages programmed therein dependent upon the fluoroscopic voltage, the improvement comprising: means for digitizing said analog output signal and an arrangement including a digital indicator for remotely indicating the prevailing exposure voltage as a numerical value, said arrangement being controlled by the analog output of said function generator, said digitizing means including a plurality of output connectors corresponding to a predetermined number of exposure voltage increments, a binary signal being applied to respectively one said output connector characterizing



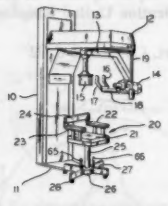
a prevailing exposure voltage increment; a coding arrangement being connected to each said indicating arrangement for each digit, said coding arrangement being controlled by the signals in said output connectors.

4,044,265

MOBILE CHAIR FOR PANORAMIC DENTAL X-RAY MACHINE

Walter A. Schmidt, Milwaukee, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 5, 1976, Ser. No. 664,162
Int. Cl.[2] G01N *21/00*; H01J *37/20*
U.S. Cl. 250—439 P **2 Claims**



1. For use with a panoramic oral radiography apparatus including arm means rotatable about a vertical axis and film holder means supported on said arm means on one side of said axis and an X-ray source supported on said arm means on the other side of said axis for said film holder means and said source to orbit about a space for accommodating the head of a radiographic examination subject in a radiographic active position;

a chair that is adapted for being locked normally in a first position such that an examination subject seated on said chair will be located substantially in said radiographic active position and which chair is removable so that a wheel chair may be situated in its place, said chair comprising:

seat means and support means including leg means supporting said seat means and roller means supporting said leg means for enabling said chair to be moved on the floor adjacent said apparatus,

one of said chair and said apparatus having first means for being engaged and disengaged, and

one of said chair and said apparatus having second means for alternately engaging and disengaging said first means, such that when said means are engaged said chair will be located in correspondence with said radiographic active position and when said means are disengaged said chair may be moved as a unit on said roller means to and from other positions,

said means for supporting said seat means comprising vertically disposed post means having an upper end on which said seat is supported and having a lower end,

means for clamping said lower end of said post means to said support means such that a portion of said post means is exposed,

means that are fixed proximate to the floor beneath said arm means, said means having a recess that is substantially complementary in shape to said exposed portion of said post means for receiving said post means,

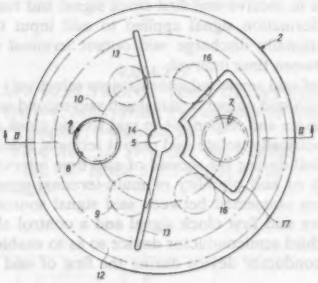
selectively operable means for locking said means for clamping and said fixed means together when said exposed portion of said post means is in said recess of said fixed means.

4,044,266

APPARATUS FOR ION-IMPLANTATION IN ELEMENTS, ESPECIALLY DISCS OF SEMI-CONDUCTING MATERIAL

Einar Jespersen, Roskilde, and Ottar Asbjørn Skilbreid, Lyngby, both of Denmark, assignors to Danfysik A/S, Denmark

Filed July 1, 1976, Ser. No. 701,498
Claims priority, application Denmark, July 9, 1975, 3103/75
Int. Cl.² G01N *21/00, 23/00;* G21G *5/00*
U.S. Cl. 250—441 **5 Claims**



1. Apparatus for ion-implantation in elements such as discs of semi-conducting material, comprising:

a. a high vacuum container;

b. an ion source and ion acceleration means disposed in said container;

c. a first disc forming a wall of said container and a second disc secured in spaced relation thereto, said discs having stationary plane parallel walls facing each other, said first disc having a first aperture leading to the interior of said container and said second disc having a second aperture leading to the atmosphere;

d. a slide valve having parallel surfaces slidably abutting said parallel walls, said slide valve having at least one through-going aperture for receiving an element through said second aperture, and for moving it into registration with said first aperture and back; and

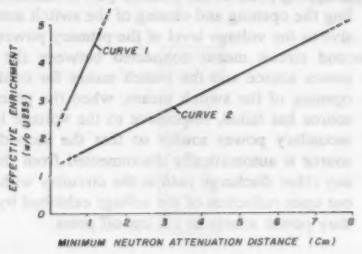
e. evacuated cavities in said discs and disposed to intercept the air introduced through said second aperture and leaking along said parallel valve surfaces, whereby air is prevented from reaching said first aperture.

4,044,267

FISSIONABLE MASS STORAGE DEVICE

Frank Bevilacqua, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Continuation-in-part of Ser. No. 558,767, March 17, 1975. This application Mar. 26, 1976, Ser. No. 671,182
Int. Cl.² G21F *5/00;* G21C *11/00*
U.S. Cl. 250—518 **7 Claims**



1. An apparatus for the safe yet compact storage of a plurality of fissionable masses having a predetermined effective fissile enrichment and having cross-sections of a given size and shape, comprising:

a. a plurality of adjacent discrete neutron absorbing open ended shields disposed in side-by-side relationship, one of each of which is adapted to parametrically encircle one of each of said plurality of fissionable masses, said neutron absorbing shields having neutron absorbing characteristics similar to the neutron absorbing characteristics of a 0.635 centimeter thick stainless steel plate containing one weight percent of natural boron and having cross-sections closely matching in size and shape the cross-sections of the fissionable masses to be stored;

b. spacing means in each of two directions for spacing each of said side-by-side neutron absorbing shields from the next adjacent neutron absorbing shield by a predetermined minimum neutron attenuation distance no less than the minimum neutron attenuation distance determined from curve 1 of FIG. 4 for said predetermined effective fissile enrichment; and

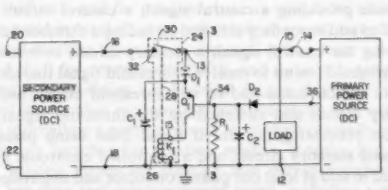
c. hydrogenous moderating means between said adjacent discrete neutron absorbing shields for moderating neutrons which are emitted from said fissionable masses whereby a neutron flux trap is created.

4,044,268

MULTIPLE POWER SOURCE AUTOMATIC SWITCHING CIRCUITRY

Ronald O. Hammel, Englewood, and Charles E. Coleman, Lakewood, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Jan. 5, 1976, Ser. No. 646,731
Int. Cl.² H02J *9/06*
U.S. Cl. 307—66 **10 Claims**



1. Automatic switching and disconnect circuitry for connecting a load normally across a primary power source, for connecting the load across a secondary power source when the primary power has failed, for disconnecting the secondary

power source when its voltage has been reduced below a predetermined cut-off point corresponding to no greater than about its 90 percent discharge level, and to reenable the primary power source when it has regained power comprising:

voltage responsive electromechanical switch means interposed between the primary and secondary power sources and operable between open and closed positions;

first circuit means connected between the switch means and a tapping point at the primary power source for controlling the opening and closing of the switch means responsive to the voltage level of the primary power source;

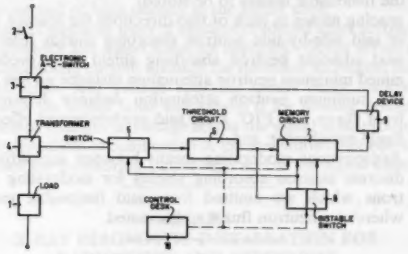
second circuit means connected between the secondary power source and the switch means for controlling the opening of the switch means, when the primary power source has failed, responsive to the voltage level of the secondary power source so that the secondary power source is automatically disconnected from the laod and any other discharge path in the circuitry with total latch out upon reduction of the voltage exhibited by the secondary power source to the cut-off point.

4,044,269

CIRCUIT ARRANGEMENT FOR A REPETITION-BLOCKING DEVICE

Eduard Hermann, Weilimdorfer Strasse 7, Korntal-Munchingen, Germany

Filed Feb. 17, 1976, Ser. No. 658,453
Claims priority, application Germany, Feb. 24, 1975, 2507807
Int. Cl.[2] H02J *4/00*
U.S. Cl. 307—149 **4 Claims**



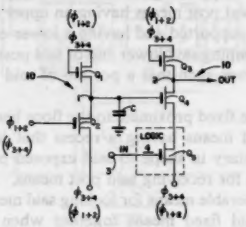
1. In a repetition-blocking device for preventing prohibited or undesired operations involving a load supplied with polyphase power, particularly for preventing the prohibited repetition of the taking of fuel from self-service fuel pumps, an improved circuit arrangement comprising, circuit means including a transformer having a primary side included in at least one phase conductor of the polyphase supply, and having a secondary side providing a control signal; a control circuit connected to said secondary side and including a threshold circuit receiving the control signal, a memory circuit connected to said threshold circuit to receive a threshold signal therefrom, a bistable switch connected to said threshold circuit and said memory circuit and switched by the threshold signal to a position preventing the stored signal from being passed on from said memory circuit, and a controlled electronic switch inserted in said at least one phase conductor and controlled and opened by the stored signal responsive to interruption of the control signal supplied from said transformer secondary side; and a resetting switch connected to said control circuit and selectively operable to reset said control circuit to the initial state.

4,044,270

DYNAMIC LOGIC GATE

Mark B. Lesser, Laguna Niguel, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed June 21, 1976, Ser. No. 698,237
Int. Cl.[2] H03K *19/08, 19/20, 19/40*
U.S. Cl. 307—205 **12 Claims**



1. A logic gate driven by a clock signal source means, said source means providing first and second recurring clock signals having opposite reference levels relative to one another during first and second time intervals and the same reference level during an in-between time interval occurring between said first and second time intervals, said logic gate including:

an input terminal;

an output terminal;

a plurality of mulit-terminal semiconductor devices;

a first of said plurality of semiconductor devices connected between said signal source means to receive said first clock signal and said output terminal to charge said output terminal during the first of said time intervals;

a second of said semiconductor devices selectively connected between said output terminal and said signal source means to receive said first clock signal and responsive to an information signal applied to said input terminal to conditionally discharge said output terminal during the in-between time interval;

a third of said semiconductor devices selectively connected between said output terminal and said second semiconductor device and responsive to said second clock signal so as to electrically isolate said output terminal from said input terminal during the second of said time intervals and

a fourth of said plurality of multi-terminal semiconductor devices connected between said signal source means to receive said first clock signal and a control electrode of said third semiconductor device so as to enable said third semiconductor device during the first of said time intervals.

4,044,271

MONOLITHIC NTDS DRIVER AND RECEIVER

Jerome J. Symanski, San Diego, and Russell L. Keefer, Spring Valley, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 9, 1974, Ser. No. 504,393
Int. Cl.[2] H03K *1/14, 5/00*
U.S. Cl. 307—262 **15 Claims**

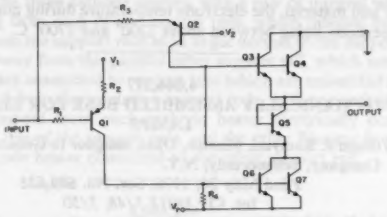
1. A level shifting network comprising:

a negative voltage logic level system having an input and an output;

a driver network including an input and an output for converting positive voltage logic levels to the negative voltage logic levels of said negative voltage logic level system comprising first and second transistor means connected to said driver input, third and fourth transistor means connected to said first and second transistor means respectively for outputting at said driver output negative voltage logic levels to said negative voltage logic level system, whereby in response to a low positive voltage logic level

signal at said driver input, said driver output is at a low negative voltage logic level and in response to a high positive voltage logic level signal at said driver input, said driver output is at a high negative voltage logic level;

a receiver network including an output for converting the negative voltage logic levels of said negative voltage logic level system to positive voltage logic levels comprising a differential amplifier having a first input connected to the output of said negative voltage logic level system, a sec-



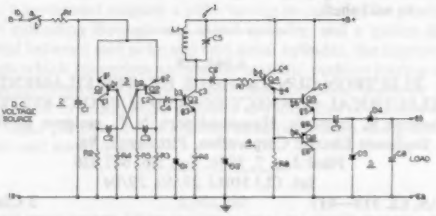
ond input, and an output, said receiver network further including a fifth transistor means connected to the output of said differential amplifier, sixth and seventh transistor means connected to said fifth transistor means for outputting positive voltage logic levels at said receiver output, whereby in response to a low negative voltage logic level and in response to a high negative voltage logic level signal at said first input, said receiver output is at a high positive voltage logic level.

4,044,272

FAIL-SAFE ELECTRONIC TIME DELAY CIRCUIT

John O. G. Darrow, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Aug. 12, 1976, Ser. No. 713,995
Int. Cl.[2] H03K *5/13*; H01H *47/18*
U.S. Cl. 307—293 **10 Claims**



1. A fail-safe time delay circuit comprising,

a. a source of d.c. voltage,

b. a resistance-capacitance network coupled to said d.c. voltage cource for charging said capacitance to said d.c. voltage,

c. an inverter coupled to said resistance-capacitance network for converting said d.c. voltage charge to a.c. signals,

d. a tuned amplifier coupled to said inverter for amplifying said a.c. signals,

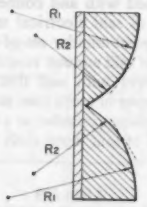
e. a rectifier coupled to said tuned amplifier, and f. a load coupled to said rectifier for normally being energized and for being deenergized a definite time interval after the source of d.c. voltage is disconnected from the circuit.

4,044,273

ULTRASONIC TRANSDUCER

Hiroshi Kanda, Tokorozawa; Kageyoshi Katakura, Naka, and Takaji Suzuki, Kashiwa, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Japan

Filed Nov. 25, 1975, Ser. No. 635,086
Claims priority, application Japan, Nov. 25, 1974, 49-134311
Int. Cl.[2] H01L *41/04*
U.S. Cl. 310—313 **16 Claims**



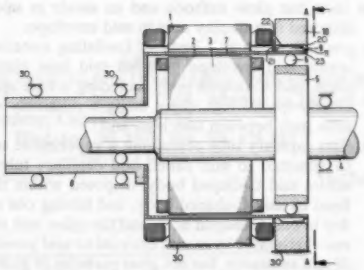
1. An ultrasonic transducer device comprising ultrasonic transducer means for generating ultrasonic waves and providing a locus of points of convergence of the generated ultrasonic waves in the form of a ring, said ultrasonic transducer means including an ulrasonic transducer formed of a piezoelectric material, said ultrasonic transducer being a surface type transducer and being provided with a shape such that a locus of points of convergence of said generated ultrasonic waves forms a ring.

4,044,274

TRANSMISSION SYSTEM

Werner Ohm, Hamburg, Germany, assignor to Stephan-Werke GmbH & Co., Hameln, Weser, Germany

Filed July 14, 1975, Ser. No. 595,978
Claims priority, application Germany, July 19, 1974, 2434834
Int. Cl.[2] F16H *33/00, 37/02*; H02K *3/42, 7/10*
U.S. Cl. 310—83 **6 Claims**



1. In a transmission system, a combination comprising an input shaft mounted for rotation about an axis; drive means for rotating said input shaft at a predetermined speed, including an electrical machine having opposite axial ends, a rotor mounted on said shaft for rotation therewith, and a stator surrounding said rotor and defining a cylindrical air gap therewith; a hollow output member mounted for rotation about said axis and means journalling a portion of said input shaft coaxially within said output member for rotation relative thereto; and step-down gearing means for rotating said output member at a speed less than said predetermined speed, including a rotary flexible non-magnetic cylindrical sleeve radially spaced from said stator and having an end region connected with said output member axially adjacent one of said axial ends of said electrical machine, another end region at the other of said axial ends of said electrical machine and having a first annular set of

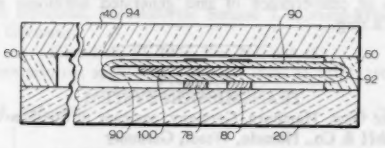
teeth on an outer circumferential region of said sleeve, and an intermediate region surrounding said rotor and extending through said gap, means for flexing said sleeve, including an eccentric element mounted on said shaft axially adjacent said other axial end of said electrical machine in juxtaposed relationship with said first set of teeth for rotation within said sleeve and for imparting the eccentricity of said eccentric element to said first set of teeth on said sleeve as said shaft rotates, anti-friction bearing means interposed between said sleeve and said eccentric element, and an annular reaction member axially aligned with and connected to said stator at said other axial end of said electrical machine, said reaction member having a second annular set of teeth on an inner circumferential region of said annular reaction member and being in meshing engagement with said first set, said second set having a greater number of teeth than said first set for permitting rotation of said output member at a speed lower than said predetermined speed of said input shaft.

4,044,275

DISPLAY PANEL HAVING IMPROVED MERCURY ASSEMBLY

George John Przybylek, Warren, and Joseph Lesky, Cranford, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 8, 1976, Ser. No. 739,986
Int. Cl.² H01J 61/12, 61/36
U.S. Cl. 313—177 **3 Claims**



1. A display panel comprising

a gas-filled envelope made up of a base plate and a face plate hermetically sealed together, said face plate having a viewing window,

at least one glow cathode and an anode in said envelope disposed in a display area in said envelope,

a generally C-shaped body of insulating material disposed within said envelope between said base plate and face plate, said C-shaped body including a base and a pair of closely-spaced legs, there being a relatively narrow gas flow path between said legs, and

a glass capillary tube containing a vaporizable substance to be admitted to said panel, said capillary tube extending across said C-shaped body, disposed within the area defined by said C-shaped body, and having one end embedded in said C-shaped body and the other end unsupported and shatterable by means external to said panel, the vapor of said substance, but not glass particles or globules of said substance, being able to diffuse into said display area through said space between said legs of said C-shaped member.

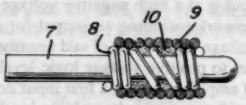
4,044,276

HIGH PRESSURE MERCURY VAPOR DISCHARGE LAMP HAVING IMPROVED ELECTRODES

William M. Keeffe, Rockport, Mass., and Frederic Koury, Alexandria, N.H., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Apr. 9, 1976, Ser. No. 675,433
Int. Cl.² H01J 17/04, 61/06
U.S. Cl. 313—218 **3 Claims**

1. In a high pressure mercury vapor arc discharge tube having a main electrode at each end thereof and containing a fill including mercury and a starting gas, the improvement which comprises an electron-emitting material on the electrodes comprising barium oxide, calcium oxide and hafnium oxide, the hafnium oxide constituting about 1/6 to ⅔ by weight



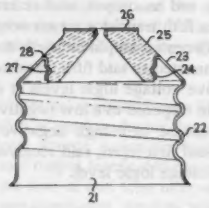
of said material, the electrode temperature during normal lamp operation being between about 1200° and 1700° C.

4,044,277

MECHANICALLY ASSEMBLED BASE FOR ELECTRIC LAMPS

William J. Komyati, Mentor, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed May 24, 1976, Ser. No. 689,635
Int. Cl.² H01J 5/48, 5/50
U.S. Cl. 313—318 **10 Claims**



1. A mechanically assembled base for an electric lamp comprising:

a base shell having an inwardly tapered end portion;

a hollow insulator having a cylindrical portion having an annular groove and a conical portion having the base thereof merging with said cylindrical portion, the taper of said conical portion being approximately the same as the taper of the end portion of said shell, said conical portion terminating in a plateau;

conductive contact means positioned on said plateau and attached to said insulator; and

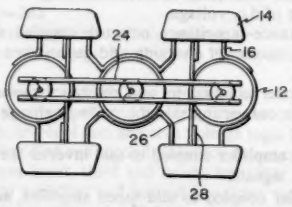
means for engaging said groove for attaching said insulator to said shell.

4,044,278

ELECTRON GUN CATHODE HEATER FILAMENT ELECTRICAL CONNECTION AND SUPPORT SYSTEM

Praveen K. Jariwala, Hammondsport, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 7, 1976, Ser. No. 647,026
Int. Cl.² H01J 29/50, 29/04
U.S. Cl. 313—417 **3 Claims**



1. An improved cathode heater filament electrical connection and support system for a three in-line electron gun color

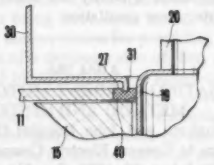
television picture tube in which the cathode heaters of each of the electron guns have filament leads extending from the rear end of the electron gun assemblies and the cathode heaters are electrically connected in parallel and are supported from a plurality of insulative support rods which are disposed about and supporting the electron gun assembly parts, the improvement wherein a pair of identical, thin, electrically conductive support rails supported from the plurality of insulative support rods, which support rails are spaced apart and disposed parallel to each other and aligned with the in-line direction and respectively offset on opposite sides from an in-line plane passing through the three cathode centers, with a pair of integral tabs extending from each of the support rails, which integral tabs extend from the support rails at an angle normal to the support rail and away from the parallel other support rail, which integral tabs are connected to support tabs which are embedded in and extend from the insulative support rods, with one cathode heater filament from each cathode heater electrically connected to one of the support rails, and the other filament from each cathode heater connected to the other support rail.

4,044,279

MAGNETRONS

Mamoru Tsuzurahara, and Ichiro Ohara, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed July 1, 1976, Ser. No. 701,661
Claims priority, application Japan, July 23, 1975, 50-101337
Int. Cl.² H01J *25/50*
U.S. Cl. 315—39.51 **5 Claims**



1. In a magnetron of the class comprising an electric discharging tube comprising a cylindrical anode electrode provided with a plurality of vanes, a cathode electrode and an output portion, said output portion comprising a cup shaped metal cylinder having an opening at a bottom portion thereof, a cylindrical insulator disposed on said bottom portion of said metal cylinder and an antenna terminal disposed on said insulator; a permanent magnet; a yoke having an opening for passing and extending through said metal cylinder; and a gasket disposed between said yoke and said metal cylinder, the improvement which comprises an annular metallic cushion having an internal diameter slightly smaller than the outer diameter of said metal cylinder, and a plurality of radial slits or notches on the inner periphery, said annular metallic cushion being fitted over said metal cylinder.

4,044,280

MULTIPLEXED SEGMENTED CHARACTER DISPLAY

Anton P. Shulski, St. Charles, Ill., assignor to NCR Corporation, Dayton, Ohio

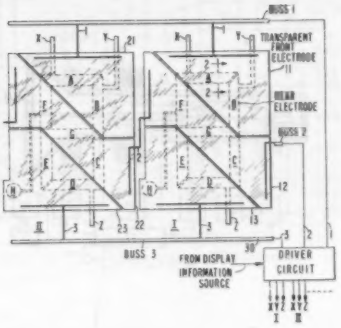
Filed Oct. 30, 1975, Ser. No. 627,170
Int. Cl.² H05B *37/00, 39/00, 41/00*
U.S. Cl. 315—169 TV **18 Claims**

1. In a segmented-matrix character display of the type comprising an enclosure containing a display medium and a plurality of opposing electrodes actively coupled electrically across at least a quantity of said display medium, the improvement wherein:

a first set of at least three electrically separated electrodes is positioned on one side of said quantity of said display medium,

a second set of at least three electrically separate electrodes is positioned on an opposite side of said quantity of said display medium,

said second set of electrodes being positioned and shaped to form a multiple-character matrix of the type in which selected combination of elements forming said matrix can be actuated to display respective differently-shaped characters, at least one of said electrodes of said second set forming a plurality of elements of said matrix, which plurality of elements are commonly connected electrically,



said first set of electrodes being positioned and shaped such that a projection thereof across said display medium on said second set of electrodes will cover said second set of electrodes,

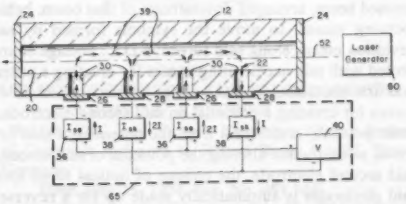
at least two adjacent electrodes of said first set being positioned so that a projection of the separation therebetween across said display medium will lie on said one electrode of said second set at a locus which divides said first electrode into a pair of adjacent elements of said matrix.

4,044,281

HIGH VOLTAGE GLOW DISCHARGE POWER SOURCE

Robert D. Washburn, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 20, 1976, Ser. No. 678,522
Int. Cl.² H01S *3/02*
U.S. Cl. 315—171 **10 Claims**



1. In a glow discharge power source, the combination comprising:

at least one elongated electronically insulating member having a bore therethrough, said bore retaining a gaseous mixture therein;

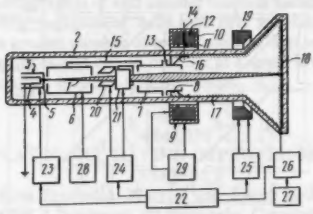
electrodes positioned at predetermined locations of and attached to the outer surface of the member; and

active electronic current sources and sinks connected in alternation to said electrodes.

4,044,282
CATHODE-RAY TUBE WITH VARIABLE ENERGY OF BEAM ELECTRONS

Genrikh Dmitrievich Balandin, ulitsa Tsentralnaya, 4a, kv. 23, Fryazino Moskovskoi oblasti, and Nikolai Grigorievich Rumyantsev, ulitsa Komsomolskaya, 7/1, kv. 106, Schelkovo Moskovskoi oblasti, both of U.S.S.R.

Continuation of Ser. No. 515,633, Oct. 17, 1974, abandoned.
This application Oct. 20, 1976, Ser. No. 734,272
Int. Cl.[2] H01J *29/58, 29/64*
U.S. Cl. 315—382 1 Claim

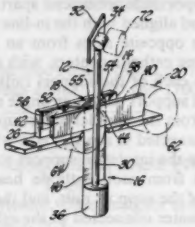


1. A cathode-ray tube with variable electron energy, comprising: a glass bulb having an axis and front and rear portions; a screen located in said front portion and being coated with a luminophore whose luminescence color varies with the change of the electron-beam energy impinging upon said screen; an electron source arranged in said rear portion and emitting a diverging electron beam; electron accelerating means arranged in said bulb behind said source, downstream of the diverging beam; first deviation means for the diverging beam, arranged behind said accelerating means, downstream of the diverging beam, to form symbols on said screen; means for focusing the diverging beam with the variable electron energy, located downstream of the beam, behind said first deviation means; two axisymmetrical electrodes serving as an electrostatic lens for said focusing means, mounted with a gap therebetween along the bulb axis; the first one of said electrodes being downstream of the focused beam and electrically connected with said accelerating means; the second of said electrodes being electrically connected with said screen; an axisymmetrical magnetic lens for said focusing means, located behind said electrostatic lens, downstream of the focused beam, and having a magnetic field intensity that is constant in time, and being arranged beyond said bulb; second deviation means for the focused beam, arranged downstream of that beam, behind said focusing means, to move the symbols formed by said first deviation means along said screen; a D.C. voltage source connected with said accelerating means for creating a potential on said first electrode; an A.C. voltage source connected with said screen for creating a potential on said second electrode, which latter potential is different from the potential of said first electrode, so that while altering the potential of said screen, and of said second electrode, the change of optical force formed by said electrodes is automatically made up for a reverse conjugated alteration of the optical force of said magnetic lens, so that under two values of the potential of said screen, consecutively changed in time, automatically ensures simultaneously both the invariable focusing of lines forming the symbols on said screen, and the invariable size of the symbols formed by said first deviation means; and other power sources electrically connected with said electron source, said deviation means and said magnetic lens, respectively; said electron source, said accelerating means, said focusing means and said deviation means being arranged along the bulb axis.

4,044,283
ELECTROMECHANICAL RESONATOR

William Allison, Huntington Station, N.Y. 11743, assignor to Schiller Industries, Inc., Troy, Mich.

Filed Oct. 22, 1975, Ser. No. 624,791
Int. Cl.[2] H02K *33/00*
U.S. Cl. 318—128 22 Claims

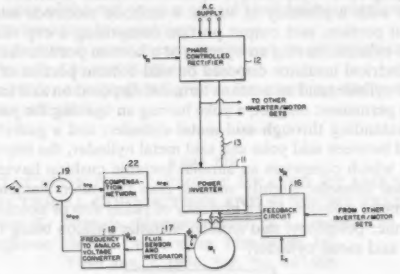


1. A resonator comprising a frame member, a nodal zone member, a first resonant system including a torsion element having one end fixed to the nodal zone member and an oscillating mass fixed to the other end, a second resonant system fixed to the nodal zone member and disposed on the same side of the nodal zone member as the first resonant system and in side-by-side relation with the first resonant system, a coupling spring suspending said nodal zone member from said frame member and means coupled with one of said resonant systems for driving it into oscillation whereby the other resonant system is driven in counterphase oscillation.

4,044,284
ALTERNATING CURRENT MOTOR CONTROL METHOD AND SYSTEM

Allan Barr Plunkett, and John Douglas D'Atre, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Aug. 19, 1975, Ser. No. 605,847
Int. Cl.[2] H02P *5/40*
U.S. Cl. 318—227 30 Claims

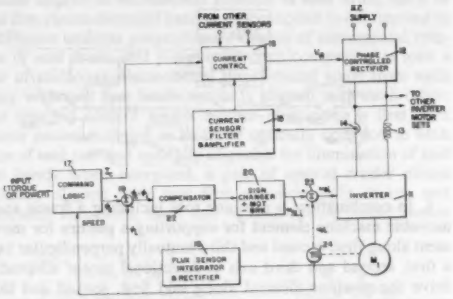


1. In a feedback loop stabilization control system for controlling the operation of power conversion circuit means supplying alternating current electric power to alternating current electric machines of the synchronous or asynchronous type; the improvement comprising machine frequency responsive sensing means for developing an alternating signal having a frequency indicative of the frequency of the rotating electromagnetic flux produced in such a machine, feedback signal deriving means for deriving from said alternating signal a feedback signal having a value that is a measure of the frequency of said alternating signal, and compensating circuit means responsive to the value of said feedback signal for influencing the operation of said power conversion circuit means so as to control the frequency of the alternating current supplied to the machine.

4,044,285
METHOD AND APPARATUS FOR CONTROLLING VARIABLE SPEED, CONTROLLED CURRENT INDUCTION MOTOR DRIVE SYSTEMS

Allan Barr Plunkett, and John Douglas D'Atre, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Aug. 19, 1975, Ser. No. 605,848
Int. Cl.[2] H02P 5/40
U.S. Cl. 318—227 **47 Claims**



1. A new and improved induction motor control system including in combination electric power conversion apparatus having input terminals adapted to be coupled to a source of electric energy and output terminals adapted to supply alternating current excitation to an induction motor at a desired stator excitation frequency, motor flux sensing means for deriving a first feedback signal representative of the magnitude of electromagnetic flux being developed across the stator-rotor gap of the induction motor, means for providing a first control signal representative of a desired value of flux, and flux regulating means coupled to said conversion apparatus and responsive to said feedback signal and said first control signal for controlling the frequency of the stator excitation alternating current supplied to the induction motor by said apparatus as necessary to minimize the difference between the value of said feedback signal and the value of said first control signal.

4,044,286
CONTROL CIRCUIT FOR HOSPITAL BED

James S. Adams, Batesville, and Charles W. Cutler, Indianapilis, both of Ind., assignors to Hill-Rom Company, Inc., Batesville, Ind.

Filed June 23, 1976, Ser. No. 699,069
Int. Cl.[2] H02P 1/00
U.S. Cl. 318—297 **15 Claims**

1. A control circuit for a bed with a movable portion actuated by an electric motor, the control circuit having a selecting portion and a power portion and comprising:

a source of AC power;

a first field winding for the electric motor, energization of said first field winding causing the motor to raise the movable portion of the bed;

a second field winding for the electric motor, energization of said second field winding causing the motor to lower the movable portion of the bed;

a first bidirectional power switch to cause said first field winding to be selectively energized by said source of AC power;

a second bidirectional power switch to cause said second field winding to be selectively energized by said source of AC power;

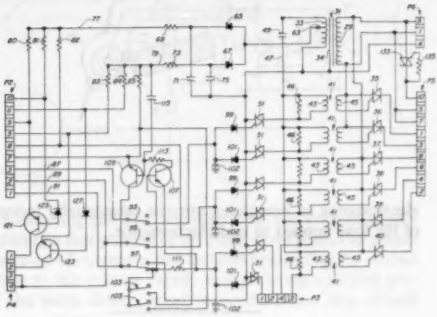
a first gating transformer to provide an actuating signal for said first bidirectional switch while isolating the selecting portion from the power portion of the control circuit;

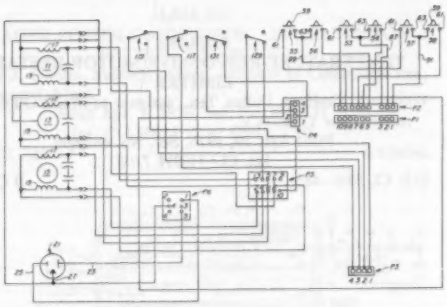
a second gating transformer to provide an actuating signal for said second bidirectional switch while isolating the selecting portion from the power portion of the control circuit;

a power transformer having primary and secondary windings, the secondary winding of said power transformer being grounded;

a first bidirectional gating switch to cause selective energization of said first gating transformer from the secondary winding of said power transformer;

a second bidirectional gating switch to cause selective energization of said second gating transformer from the secondary winding of said power transformer;





phase shifting means between the secondary winding of said power transformer and said gating transformers to produce actuating signals for said bidirectional power switches that properly commutate said bidirectional power switches; and

switch means to selectively actuate said bidirectional gating switches from the secondary of said power transformer.

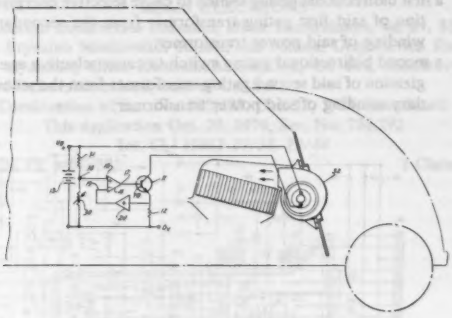
4,044,287
CIRCUIT FOR ENERGIZING THE ELECTROMOTOR DRIVING A BLOWER

Rüdiger Ratzel, Buhl, and Helmut Steinmann, Baden-Baden, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed July 23, 1974, Ser. No. 491,146
Claims priority, application Germany, July 27, 1973, 2338215
Int. Cl.[2] H02P 7/00
U.S. Cl. 318—432 **9 Claims**

1. In a motor vehicle provided with a blower for blowing air into the interior of the motor vehicle, the blower being a radial-flow blower provided with a drum rotor the vanes of which are curved in the forward direction, and the blower being subjected to a load which varies as a function of the vehicle speed, in combination, an electromotor for driving said blower, whereby said electromotor is likewise subjected to load varia-

tions dependent upon vehicle speed, and a constant current source connected to said electromotor for furnishing to the



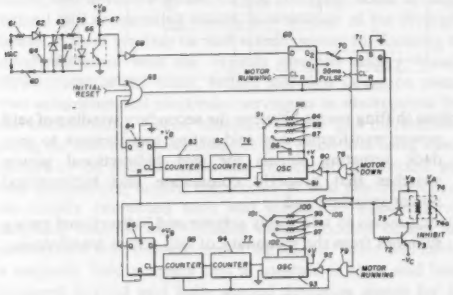
electromotor an energizing current substantially independent of the load applied to said electromotor.

4,044,288

TEMPERATURE-RESPONSIVE MOTOR RESTART LIMITER

William L. Godfrey, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 29, 1976, Ser. No. 681,666
Int. Cl.[2] H02H *7/08*
U.S. Cl. 318—485 **9 Claims**



1. A system for controlling the operation of a motor to prevent damaging heat build-up within the motor, comprising:

a. means responsive to the condition of said motor for producing a start signal each time the motor is started and a stop signal each time the motor fails,

b. means responsive to a select temperature condition of said motor for indicating whenever such temperature condition exceeds a predetermined level,

c. a counter that is set to count start signals whenever the temperature condition exceeds said predetermined level,

d. means for resetting said counter whenever the motor runs continuously during a first time period following a predetermined number of motor starts,

e. means for inhibiting the restarting of the motor during a second time period whenever the motor fails to run continuously for said first time period following said predetermined count of motor start signals, and

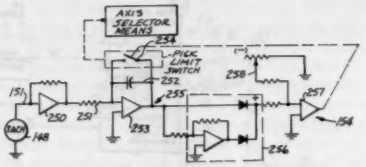
f. means for allowing the restarting of said motor following said second time period.

4,044,289

CYCLING SYSTEM FOR TRACER-CONTROLLED MACHINE TOOLS

Robert H. Wenzel, Orange, and Franklin O. Stavros, Pomona, both of Calif., assignors to Textron Inc., Providence, R.I.

Continuation of Ser. No. 455,019, March 26, 1974, abandoned. This application Aug. 27, 1975, Ser. No. 608,217
Int. Cl.[2] G05B *19/36*
U.S. Cl. 318—571 **8 Claims**



1. In combination: a machine tool including a frame and a movable machine element for supporting a pattern for movement along first, second and third mutually perpendicular axes; a first, second and third axis bi-directional motor adapted to drive the machine element along said first, second and third axes, respectively; a tracer mechanism mounted to the frame and including a body and a stylus having a tip adapted to trace over the surface of a pattern; mounting means mounting said stylus to the body, the stylus having a longitudinal axis which is generally aligned with the first axis, and is mounted for axial shifting movement along the first axis, and for lateral movement of its tip in all lateral directions from the first axis; first axis power control means, second axis power control means, and third axis power control means mounted to the body and responsive to components of stylus tip deflection along the respective first, second and third axes to control the application of power to the respective first, second and third axis motor in response to said stylus deflection; axis selector means for selecting two of the power control means and respective motors to establish a tracing plane in which the stylus traces the surface of the pattern in response to the two selected power control means; limit means defining the limit of travel of the stylus along the second and third axes and adapted to cause the axis selector means to select the previously-unselected one of the power control means and its respective motor and one of the previously selected power control means and its respective motor, thereby selecting a new cutting plane for pick movement over the surface of the pattern in response to the two power control means which are respective to the newly-selected axes; distance measuring means for terminating said pick movement at the conclusion of a predetermined distance of movement along one of the newly-selected axes, and adapted to cause the axis selector means again to select the first-named pair of power control means and their respective motors, whereby a pair of parallel paths for trace cuts are established which are laterally spaced apart by a pick distance, all movements in trace cut and in pick movement being under control of at least two power control means which tend to maintain substantially constant the surface rate of travel of the stylus over a pattern.

4,044,290

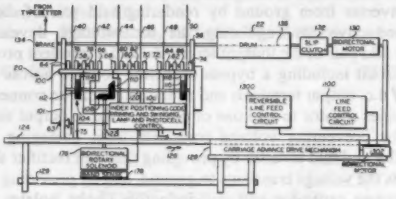
DRUM CONTROL SYSTEM

Robert Gullo, Staten Island, N.Y., assignor to Typographic Innovations Inc., New York, N.Y.

Filed June 21, 1974, Ser. No. 482,025
Int. Cl.[2] G05B *5/00*; H02H *7/08*; B41B *13/00*
U.S. Cl. 318—640 **54 Claims**

1. A drum control system for providing a predetermined incremental lateral spacing on a drum surface to be accessed in response to a request signal therefor, said system comprising means for rotatably driving said drum about the longitudinal axis thereof; means operatively connected to said drum rotat-

able driving means for controlling the degree of rotation of said drum in response to said request signal to provide said predetermined incremental lateral spacing, said rotation control means comprising a plurality of optically readable encoded discs, each of said discs having at least a first circumferentially extending band comprising a plurality of optically readable sense marks, said plurality of discs being coaxially rotatably mounted for simultaneous incremental rotation with said drum in response to said request signal, each of said sense marks is a given band corresponding to a predetermined uniform proportionate degree of incremental rotation of said drum, each of said disc circumferential bands being encoded to correspond to a different uniform proportionate degree of incremental rotation of said drum, said plurality of discs comprising at least a pair of said coaxially mounted discs spaced apart from each other with said first bands optically aligned with each other; said rotation control means further comprising a first light source means mounted so as to be optically common to both discs of said pair and optically alignable for illumination of said first bands when energized, a pair of optical reader means optically aligned with said first common light source and associated therewith, each one of said optical reader means



being associated with a different one of said discs of said pair and being optically alignable with said first band associated with said associated disc, each of said optical reader means being selectively energizable and being responsive to said sense marks on said associated first band when said optical reader is selectively energized and said first light source illuminates said first band for providing an output signal indicative of the proportionate degree of incremental rotation of said disc, and means for substantially simultaneously selectively energizing said optical reader associated with the disc band corresponding to the requested incremental lateral spacing and said first common light souce in response to said request signal; said system further comprising braking means operatively connected to said drum rotatable drive means for halting the rotatable drive of said drum in response to a braking signal, and comparator means operatively connected to said braking means and to receive said request signal and said selectively energized optical reader output signal for providing said braking signal to said braking means when said selectively energized optical reader output signal corresponds to said requested incremental lateral spacing, whereby the proportionate degree of rotation of said drum corresponds to said requested incremental lateral spacing.

4,044,291

ELECTRIC STEPPER MOTORS

Austin Hughes, and Peter John Lawrenson, both of Leeds, England, assignors to National Research Development Corporation, London, England

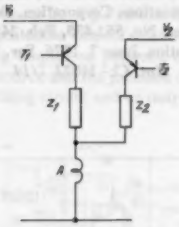
Filed Sept. 23, 1975, Ser. No. 616,013

Claims priority, application United Kingdom, Sept. 25, 1974, 41713/74

Int. Cl.[2] H02K *37/00*

U.S. Cl. 318—696 **3 Claims**

1. An electric stepper motor comprising a primary member having a plurality of drive coils with magnetic axes spaced apart with respect to one another and being adapted to be sequentially energised, and a secondary member having at least one magnetically defined axis whereby energisation of the drive coils during a drive pulse period causes relative movement between the primary and secondary members, first and second impedances of different values joined to each of said drive coils, voltage supply means, and switching means for selectively connecting each of said impedances to the voltage supply means during said pulse drive period, said switching



means connecting the first impedance to the voltage supply means during a first portion of the pulse drive period to permit rapid build-up of current in said coil and connecting the second impedance to the voltage supply means during a second portion of the pulse drive period to produce damping of said relative movement.

4,044,292

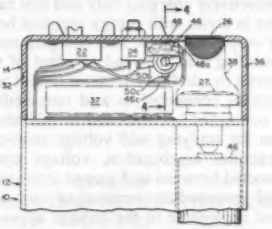
PAGER POWER CONVERSION APPARATUS FOR BATTERY CHARGING

James J. Tomlin, Sudbury, Mass., assignor to Commterm Inc., Maynard, Mass.

Filed Apr. 1, 1976, Ser. No. 672,671

Int. Cl.[2] H02J *7/00*; H04B *1/08*

U.S. Cl. 320—2 **9 Claims**



1. In a battery-powered pager originally constructed without arrangement for charging the battery while installed therein, said pager having a case with a removable top cover having an end wall and sidewalls and having mounted therein along one sidewall the pager on-off switch and the pager reset switch, each such switch having one contact connected to a different terminal of a battery installed therein, the improvement of

conversion apparatus for charging the pager battery while operatively installed therein, said conversion apparatus comprising in combination

A. a component assembly disposed within the top cover and including a fixed resistor and a semiconductor rectifying diode,

B. a power-receiving jack mounted to one cover wall through a hole therethrough adjacent the location of said component assembly, said jack having first and second contacts and being removably and replaceably connectable with a mating electrical plug for applying an alternating-voltage current from the plug to said jack contacts, and

C. means connecting said first and second jack contacts in series with said resistor and said diode between said one

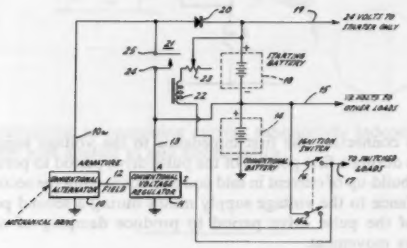
contact of said on-off switch and said one contact of said reset switch.

4,044,293

DUAL BATTERY CHARGING SYSTEM

William C. Follmer, Norristown, Pa., assignor to Ford Aerospace & Communications Corporation, Dearborn, Mich.

Continuation of Ser. No. 552,435, Feb. 24, 1975, abandoned.
This application June 7, 1976, Ser. No. 693,664
Int. Cl.[2] H02J 7/14
U.S. Cl. 320—15 **4 Claims**



1. In an engine electrical system including first and second series connected batteries, said first battery being connected between a first end terminal and an intermediate terminal of said series combination and said second battery being connected between said intermediate terminal and a second end terminal of said series combination, an alternator-rectifier combination providing between first and second alternator output terminals associated with a single charging path a direct current output at a voltage dependent upon a voltage control signal supplied to said alternator-rectifier combination and means for selectively charging only said first battery or both of said batteries in series with energy supplied between said first and second output terminals, said charging means comprising means connecting said first end terminal of said series connected batteries to said first alternator output terminal, voltage regulator means connected to said intermediate terminal of said series connected batteries and to said alternator-rectifier combination for suplying said voltage control signal to said alternator-rectifier combination, voltage controlled switch means connected between said second alternator output terminal and said intermediate terminal of said series connected batteries and responsive to the voltage appearing across said battery for alternatively connecting said second alternator output terminal to said intermediate terminal through said switch means thereby to permit current flow from said second terminal through said first battery and disconnecting said second alternator output terminal from said intermediate terminal, and current control means connecting said second alternator output terminal and said second end terminal of said series connected battery combination, said last mentioned means permitting current to flow in a selected direction to said series connected batteries when said switch means is operative to disconnect said second alternator output terminal from said intermediate terminal and to prevent flow of current in the reverse direction when said switch means is operative to connect said second alternator output terminal to said intermediate terminal.

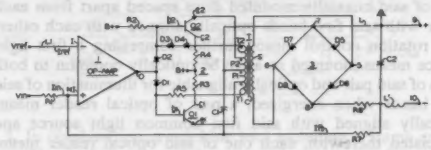
4,044,294

CONVERTER-REGULATOR CIRCUIT ARRANGEMENT

Reed H. Grundy, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Nov. 25, 1974, Ser. No. 526,514
Int. Cl.[2] H02M 3/335
U.S. Cl. 363—25 **9 Claims**

1. A converter-regulator circuit arrangement which has high immunity to voltage transients appearing on its output comprising, an amplifier having a first and a second input and an output, as reference voltage coupled to said first input, an input voltage coupled to said second input, an inverter electrically coupled to the output of said amplifier, a rectifier having its a.c. input terminals electrically coupled to said inverter and having a pair of d.c. output terminals, a feedback circuit coupled between one of said pair of d.c. output terminals of said rectifier by a feedback resistor and providing a feedback voltage to said second input of said amplifier for controlling the conductive condition of said amplifier and in turn for causing said amplifier to clamp said inverter to ground by rendering a pair of diodes conductive and for causing said amplifier to unclamp



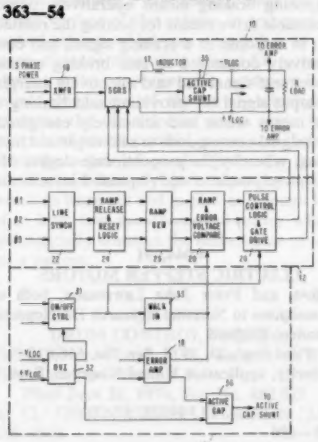
said inverter from ground by rendering said pair of diodes nonconductive for regulating the d.c. voltage developed across said pair of d.c. output terminals, and a transient protection circuit including a bypass capacitor coupled across said pair of d.c. output terminals and an inductive choke connected by a series resistor to said one of said pair of d.c. output terminals for preventing voltage transients from damaging said amplifier and said inverter by providing that said rectifier short circuits the voltage transients to ground, and by providing that said bypass capacitor and said inductive choke isolates said inverter from the voltage transients and by providing that said feedback resistor decreases the magnitude of the voltage transients appearing on said second input of said amplifier.

4,044,295

OVER-VOLTAGE INTERRUPT FOR A PHASE CONTROLLED REGULATOR

Frank A. Ferraiolo, Newburgh, and Roy K. Griess, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,285
Int. Cl.[2] H02M 1/18
U.S. Cl. 363—54 **9 Claims**



1. In a phase controlled regulator an over-voltage interrupt circuit comprising in combination:

a sensing means for sensing the outputs of the phase con-

trolled regulator and for generating a voltage proportional to the voltage difference between the outputs;

a reference generator for generating a reference;

a comparator means having the reference connected thereto as one input for establishing an upper threshold and having positive feedback establishing a resetting threshold lower than said setting threshold;

an on/off controller means for controlling the on and off switching of said regulator;

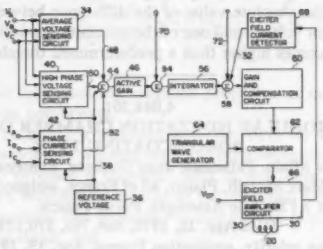
a first switching means for providing an override signal to said on/off controller which turns said regulator off in response to a sensed output above said setting threshold and turns said regulator on in response to a sensed output below said resetting threshold, thereby providing output voltage off/on sequencing between said setting and resetting threshold values in response to an over-voltage.

4,044,296

ELECTRONIC VOLTAGE REGULATOR FOR THREE-PHASE GENERATORS

P. John J. Dhyanchand; Timothy F. Glennon, and Roland W. Christen, all of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 14, 1976, Ser. No. 649,006
Int. Cl.[2] H02P *9/30*
U.S. Cl. 322—25 **25 Claims**



1. An electronic voltage regulator for generators having exiter field circuits, comprising:

means for sensing the voltage output of the generator;

means, responsive to said voltage sensing means, for comparing the voltage output to a reference value;

means for sensing the current output of the generator;

means, responsive to said current sensing means, for comparing the current output to a reference value;

means, responsive to said voltage and said current comparing means, for generating an error signal;

means, responsive to said error signal, for integrating said error signal over time; and

means, responsive to said integrated error signal, for controlling the exciter field circuit, thereby regulating the voltage and current output of the generator.

4,044,297

ULTRASONIC GENERATOR WITH COMBINED OSCILLATOR AND CURRENT REGULATOR

Takaaki Nobue, Yamatokoriyama; Masao Itou, Nara; Katsuhiko Yamamoto, Nabari, and Makoto Hori, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

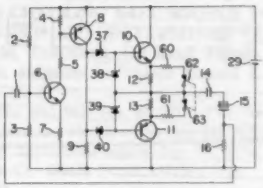
Filed Dec. 5, 1975, Ser. No. 637,875
Claims priority, application Japan, May 20, 1975, 50-60822; June 19, 1975, 50-75133
Int. Cl.[2] G05F *1/44;* H03F *3/18*
U.S. Cl. 323—4 **8 Claims**

1. An ultrasonic generator comprising:

a constant current circuit including a first bipolar transistor whose emitter is connected to one end of a resistor and base is connected to one end of a constant-voltage regulating element, the other ends of said resistor and said constant-voltage regulating element being connected together;

a first switching circuit including a second bipolar transistor whose base is connected to the base of said first transistor to form a complementary symmetry circuit with said first transistor;

an ultrasonic transducer having a natural frequency at which the dynamic admittance thereof becomes maximum, said transducer being connected between one terminal of an electric power source and the junction of an output terminal of said switching circuit and an output terminal of said



constant-current circuit; said output terminal being coupled to the emitters of said transistors;

a second switching circuit whose output terminal is connected to the bases of said first and second transistors and adapted to drive the others of said circuits with a square wave having a frequency substantially equal to the natural frequency of said ultrasonic transducer; and

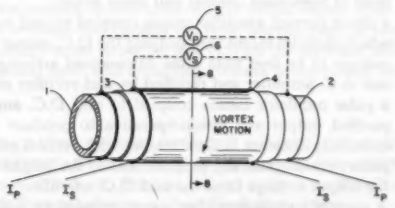
a feedback circuit coupled between said transducer and said second switching circuit and adapted to provide an AC feedback voltage in proportion to the current flowing through said ultrasonic transducer to cause said generator to oscillate at said natural frequency.

4,044,298

SUPER CONDUCTING DEVICE WITH MINIMAL PINNING

John Walter Ekin, 1345 Drexel St., Boulder, Colo. 80303

Filed Mar. 26, 1975, Ser. No. 562,295
Int. Cl.[2] G05F *7/00;* H01F *10/00*
U.S. Cl. 323—44 F **6 Claims**

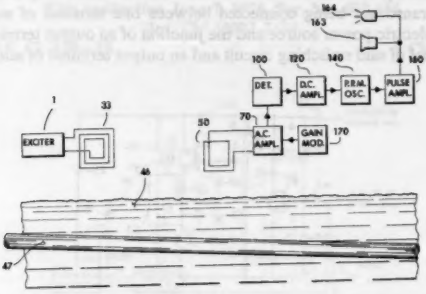


1. A device comprising a Type II superconductive material and means for inducing movement of vortices in the superconductive material positioned adjacent the superconductive material, the superconductive material having a ratio at constant reduced temperature of $\langle D \rangle$, the average scale of structural disorder in such material, to ξ, the vortex core size, less than 120% of the minimum obtainable such ratio, but less than unity.

4,044,299
CONCEALED STRUCTURE LOCATING AND SURVEYING TRANSLATOR APPARATUS

Harold James Weber, 20 Whitney Drive, Sherborn, Mass. 01770

Filed Dec. 22, 1975, Ser. No. 643,606
Int. Cl.[2] G01V 3/08, 3/10
U.S. Cl. 324—3 23 Claims



1. A translator means for locating a concealed structure which intercepts alternating current electromagnetic field lines reradiating from the concealed structure, where-in the electromagnetic field lines have been introduced into the structure directly or inductively by a separate exciter means and furthermore where-in the structure is a buried or otherwise concealed pipe, cable, or like conductive object, and thereby produces in the said translator a sensory indication of the relative proximity of the said translator to the said concealed structure, including in combination:

a. a directional inducer which produces a minute alternating current voltage from the said electromagnetic field lines re-radiated from the concealed structure;

b. an A.C. amplifier means coupled to said directional inducer which increases the magnitude of the said minute signal voltage;

c. a rectifier means coupled to said A.C. amplifier means, said rectifier means operative to establish the threshold of rectification of the amplified A.C. voltage signal;

d. a modulator means coupled to said A.C. amplifier operative to cause the gain amplification of said A.C. amplifier to be cyclically varied from a point of maximum gain to a point of decreased gain wherein said point of maximum gain is sufficient to produce a significant electronic-noise output from the A.C. amplifier, said variation is gain being at a slow periodic rate independent of the signal being amplified, and furthermore that in the absence of an incoming signal the magnitude of the said cyclical variation causes the output of the A.C. amplifier to vary between a level of high-noise content and lesser noise;

e. a direct current amplifier means coupled to said rectifier which includes means for purifying the D.C. output signal voltage to be free from noise fluctuations arriving from said A.C. amplifier and rectified by said rectifier means;

f. a pulse oscillator means coupled to said D.C. amplifier purified output and being operative to produce pulses essentially constant in duration but with various pulse-to-pulse periods generally proportional to the magnitude of the output voltage from the said D.C. amplifier;

g. a current switch amplifier means coupled to said pulse oscillator means which follows the said pulse oscillator and causes higher magnitude current pulses to be outputed;

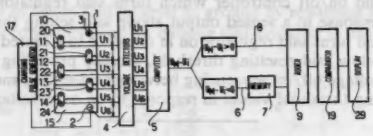
h. a sensory indicating means coupled to said current switch amplifier;

i. a source of direct current power including a disconnect means so arranged as to provide operating voltage and current to each of the functional circuit groups comprising the translator.

4,044,300
METHOD FOR CHECKING A STORAGE BATTERY

Jean-Michel Dupuis, Gennevilliers, and Pierre Lasserre, Nanterre, both of France, assignors to Compagnie Europeenne d'Accumulateurs, Paris, France

Filed June 24, 1976, Ser. No. 699,401
Claims priority, application France, June 24, 1975, 75.19747
Int. Cl.[2] G01N 27/42
U.S. Cl. 324—29.5 8 Claims



1. A method of checking a storage battery with series-connected cells comprising the following steps:

passing a charging current pulse through the battery;

measuring elementary transient voltages at the terminals of each storage cell; and measuring a total transient voltage and dividing the total voltage by the number of storage cells to obtain an average transient voltage,

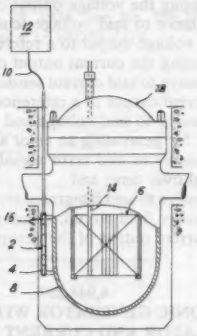
comparing the elementary transient voltages with the average transient voltage of said storage cells; and

providing a battery reject signal as a result of said comparing if the absolute value of the difference between said transient voltage and one of the elementary transient voltages, becomes higher than a predetermined threshold.

4,044,301
MODULAR IONIZATION CHAMBER OF THE BORON-COATING TYPE

Jacques Allain, Palaiseau; Jean Duchene, Fontenay-aux-Roses, and Marc Merelli, Plaisir, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 21, 1975, Ser. No. 570,131
Claims priority, application France, Apr. 19, 1974, 74.13768
Int. Cl.[2] G01N 27/00; H01J 39/22
U.S. Cl. 324—33 4 Claims



1. A boron-coating ionization chamber comprising a leak-tight cylindrical casing containing N modules each operating as an independent ionization chamber, each module being constituted by a central cylindrical core serving as a support by means of cylindrical insulating rings in concentric relation to said central core for two concentric cylindrical electrodes Ea and Eb whose opposite faces are provided with a coating of boron, electrically insulated resilient means for maintaining each module radially with respect to said casing including three transverse springs working in compression and disposed at angular intervals of 120°, said springs attached to the central core of said module and applied by means of an insulating ball

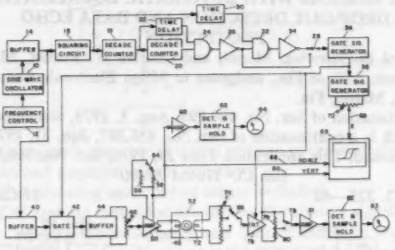
against the internal surface of the casing, and electrically insulated resilient means for maintaining the modules longitudinally with respect to each other including six longitudinal springs disposed at angular intervals of 60°, said springs be placed between the core of the adjacent module and the insulating rings.

4,044,302

TEST SET FOR MEASURING MAGNETIC PROPERTIES OF MAGNETIC AMPLIFIER CORES BY SINUSOIDAL CURRENT EXCITATION

Leonard Adolphus Mayberry, 710 Paul St., Escondido, Calif. 92027

Filed June 9, 1976, Ser. No. 694,308
Int. Cl.² G01R *33/12*
U.S. Cl. 324—34 MC **13 Claims**



1. A test set for measuring magnetic properties of magnetic amplifier cores, comprising,

means for receiving a magnetic amplifier core for test, including a primary winding for applying a sinusoidal drive signal to produce a magnetic field in said core, and a secondary winding for sensing an output signal indicative of the magnetic flux produced in said core in response to said drive signal, and

means for producing a repetitive constant current sinusoidal drive signal coupled to said primary winding for providing said applied sinusoidal drive signal,

wherein the improvement comprises,

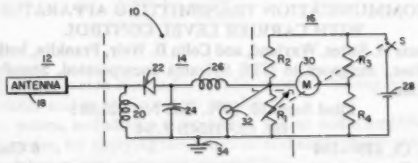
means for causing said sinusoidal drive signal to be repeated at a low duty cycle rate of not more than one full sine wave in one hundred sine waves.

4,044,303

MICROWAVE RADIATION DETECTOR

John Reindel, 5352 Via Carancho, San Diego, Calif. 92111

Filed Nov. 10, 1975, Ser. No. 630,229
Int. Cl.² G01R *21/04, 31/02*
U.S. Cl. 324—95 **9 Claims**



1. A microwave radiation detector comprising:

first means for receiving r.f. signals;

a negative resistance device connected to said first means and having an I-V characteristic including a positive resistance operating region and a negative resistance operating region and a point of peak current therebetween;

an oscillation network connected to said negative resistance device;

bias supply means connected to said oscillation network and to ground for biasing said negative resistance device in said positive resistance operating region when no r.f. signal has been received by said first means, the output of said first means biasing said negative resistance device at least temporarily into said negative resistance operating region; and

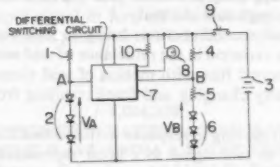
sensing means connected to said oscillation network for indicating the amplitude of said r.f. signals.

4,044,304

DEVICE FOR CHECKING A D C SOURCE VOLTAGE RELATIVE TO A PREDETERMINED VALUE

Ichiro Hamaguchi, Yokohama, and Kenji Toyoda, Kawasaki, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Division of Ser. No. 542,542, Jan. 20, 1975, Pat. No. 3,970,933.
This application Feb. 11, 1976, Ser. No. 657,277
Claims priority, application Japan, Jan. 28, 1974, 49-10890
Int. Cl.² G01R *19/16;* G01N *27/46*
U.S. Cl. 324—133 **1 Claim**



1. In a device for checking and indicating the voltage of a D.C. source relative to a predetermined value and including a detecting circuit connected across said D.C. source and having a detecting terminal, the detecting circuit detecting whether the voltage of a D.C. source is higher than a predetermined value and generating a detecting signal at the said detecting terminal; and an indicating element connected at its one end to the said detecting terminal and at its other end to one terminal of said D.C. source to be turned on upon receiving the said detecting signal and to be turned off when said detecting signal is not received; an oscillation preventing device comprising an output terminal provided in the said detecting circuit to generate a signal when the voltage across said D.C. source is less than said predetermined value; and resistor means connected at its one end to the said output terminal and at its other end to said one terminal of said D.C. source and having a resistance value substantially equal to that of said indicating element so that said resistor means receives the output signal from said output terminal and permits the flow therethrough of current substantially equal to the current flowing through said indicating element upon said indicating element being turned on.

4,044,305

APPARATUS FOR PROVIDING A DISPLACEMENT REPRESENTATIVE OF THE MAGNITUDE OF A SIGNAL

George A. Oberbeck, Belmont, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Mar. 17, 1975, Ser. No. 558,960
Int. Cl.² G01R *5/14, 1/00*
U.S. Cl. 324—154 R **12 Claims**

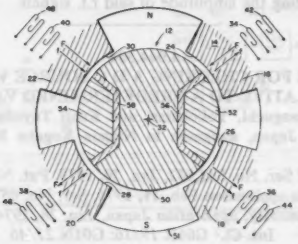
1. Apparatus for providing a displacement proportional to a signal magnitude comprising:

an element having first and second sections of high magnetic permeability separated by a spacer of low magnetic permeability;

means for motionally suspending the element;

means for applying a first magnetic flux to said element and to the first and second sections thereof;

said first and second sections being configured to provide a variation in the reluctance for said first magnetic flux through the first section with motion of said element and a generally lesser variation in reluctance to the first flux through the second section with motion of the element thereby producing a force on said element dependent upon position thereof; and



means for applying a second flux representative of said signal through said element;

said first and second sections being further configured to provide a variation in the reluctance of said second section to said second flux with motion of said element without substantially changing said force resulting from said first flux;

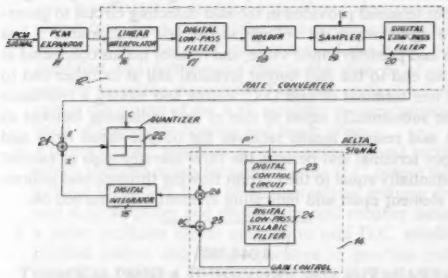
said element moving in response to the second flux applied in response to said signal to a point representative of said signal.

4,044,306

DIGITAL CONVERTER FROM PULSE CODE MODULATION TO CONTINUOUS VARIABLE SLOPE DELTA MODULATION

Michel Villeret, Sherbrooke; Hubert Stephenne, Rock Forest, and Pierre A. Deschenes, Sillery, all of Canada, assignors to Universite de Snerbrooke, Sherbrooke, Canada

Filed July 26, 1974, Ser. No. 492,022
Int. Cl.[2] H03K *13/24*
U.S. Cl. 325—38 B **10 Claims**



1. A digital converter for converting a compressed pulse code modulation (PCM) signal provided from a pulse code modulation system and being at a predetermined rate into a delta signal flowing at a delta rate, said delta signal being supplied to a delta modulation telecommunication system, comprising:

a. a first conversion means receiving said compressed PCM signal for converting the code thereof into a intermediate code, said intermediate code being at a rate corresponding to said PCM rate;

b. a second conversion means connected to said first conversion means for converting the rate of said intermediate signal into the delta rate; and

c. a third conversion means fed with said intermediate signal at said delta rate for converting the code thereof into the code of the delta signal, said third conversion means comprising:

a comparator for comparing the intermedite signal at the delta rate with a feedback signal and for providing an output signal,

a quantizer connected to receive the output signal of said comparator, said quantizer having an output for providing said delta signal at the delta rate, and

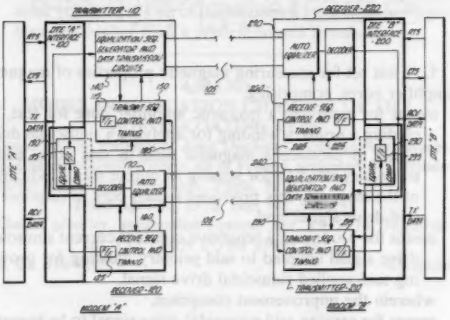
means connected between the output of said quantizer and the comparator for providing said feedback signal to said comparator.

4,044,307

DATA MODEMS WITH AUTOMATIC EQUALIZATION, DROP-OUT DETECTION AND DATA ECHO PROTECTION

Richard Borysiewicz, Miami, and Charles W. Roedel, Miami Shores, both of Fla., assignors to Milgo Electronic Corporation, Miami, Fla.

Continuation of Ser. No. 600,895, Aug. 1, 1975, abandoned, which is a continuation of Ser. No. 438,387, Jan. 31, 1974, abandoned. This application June 29, 1976, Ser. No. 700,903
Int. Cl.[2] H04M *11/00*
U.S. Cl. 325—42 **19 Claims**



18. In a modem system, a method of equalizing for line distortion prior to successive data transmissions comprising the steps of:

sending a long equalization sequence;

initially equalizing in accordance with said long equalization sequence prior to a first data transmission; and

re-equalizing in accordance with a short equalization sequence prior to a second data transmission.

4,044,308

COMMUNICATION TRANSMITTING APPARATUS WITH CARRIER LEVEL CONTROL

Francis H. Stites, Wayland, and Colin B. Weir, Franklin, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sept. 20, 1976, Ser. No. 725,001
Int. Cl.[2] H04B *1/04*
U.S. Cl. 325—144 **6 Claims**

1. Communication transmitting apparatus including in combination

a source of an RF carrier signal;

audio signal input means for conducting an audio signal;

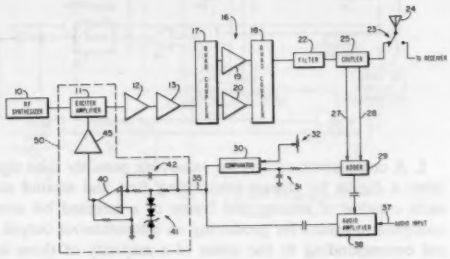
first amplifier means having an input connected to said source of an RF carrier signal;

second amplifier means having an input coupled to the output of the first amplifier means;

control signal means coupled to the output of the second

amplifier means and operable to produce a DC control signal related to the carrier signal voltage at the output of the second amplifier means; and

modulating and control means connected to the audio signal input means, the control signal means, and the first amplifier means for amplitude modulating the RF carrier signal produced at the output of the first amplifier means with the audio signal and for adjusting the carrier signal voltage produced at the output of the first amplifier means in response to the DC control signal and in a manner tending



to maintain the carrier signal voltage at the output of the second amplifier means constant;

said modulating and control means including

DC limiting means for preventing the control signal from causing the modulating and control means to increase the carrier signal voltage at the output of the first amplifier means above a predetermined voltage, and

audio by-pass means for causing the audio signal to by-pass said DC limiting means whereby said DC limiting means has no effect on the audio signal.

4,044,309

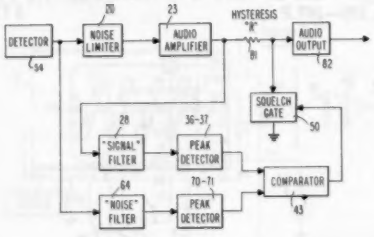
AUTOMATIC SQUELCH CIRCUIT WITH HYSTERESIS

John F. Smith, Warminster, Pa., assignor to Narco Scientific Industries, Inc., Fort Washington, Pa.

Continuation of Ser. No. 489,597, July 18, 1974, abandoned. This application Feb. 9, 1976, Ser. No. 656,259

Int. Cl.[2] H04B *1/10*

U.S. Cl. 325—478 **2 Claims**



1. In a squelch circuit for a radio receiver having an audio detector and an audio output amplifier,

a. means, including a noise limiter and an audio amplifier in series, for applying the output of said audio detector to the input of said audio output amplifier;

b. said audio amplifier having an output circuit which includes a voltage divider comprising a series resistor and a shunt resistor, the resistance of said series being low relative to the resistance of the shunt resistor;

c. an electronic squelch gate having conductive and nonconductive states, said squelch gate having an output circuit connected in parallel with said shunt resistor of said audio amplifier;

d. a comparator having first and second input circuits for receiving audio and noise signals, respectively;

e. means coupling the noise-limited audio output of said audio amplifier to said first input circuit of said comparator;

f. means, including a noise filter for passing noise signals above the audio range, coupling said audio detector to said second input circuit of said comparator;

g. means coupling the output of said comparator across the input of said squelch gate;

h. said comparator, in response to predominantly noise signals, developing and applying to said squelch gate a signal of a polarity to cause said squelch gate to be conductive, whereby the impedance of its output circuit becomes low and effectively shorts out said shunt resistor in the output circuit of said audio amplifier;

i. said comparator, in response to predominately noiselimited audio signals, applying to said squelch gate a signal of a polarity to cause said gate to be nonconductive, whereby the impedance of its output circuit becomes high and maintains the effectiveness of said shunt resistor in the output circuit of said audio amplifier; non-conductive,

j. whereby once the squelch gate becomes non-conductive the amplitude required of a decreasing audio input signal to maintain said squelch gate non-conductive is substantially less than the amplitude required of an increasing audio input signal to turn off a conducting squelch gate, whereby said squelch circuit exhibits a hysteresis character.

4,044,310

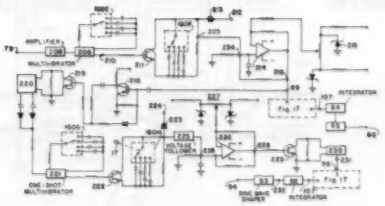
CIRCUITRY FOR GENERATING A SINE WAVE AND/OR COSINE WAVE FROM A PULSE SIGNAL

Robert S. Morrow, Columbus, and Lloyd D. Penn, Johnstown, both of Ohio, assignors to IRD Mechanalysis, Inc., Columbus, Ohio

Division of Ser. No. 420,594, Nov. 30, 1973, Pat. No. 3,938,394. This application Dec. 4, 1975, Ser. No. 637,751

Int. Cl.[2] H03K *5/08*

U.S. Cl. 328—27 **1 Claim**



1. In an electronic circuit for generating a sine wave and a corresponding cosine wave each having a fundamental frequency corresponding to the frequency of repetitive voltage input pulses, including:

A. means for generating the said sine wave including:

means responsive to each pulse for generating a uniformly changing electrical sawtooth signal;

a square wave generator which generates a first square wave signal having a positive excursion corresponding to one-half of the said sawtooth signal and having a negative excursion corresponding to the other half of the said sawtooth signal;

means for integrating the said first square wave signal to produce a first triangular wave having a fundamental frequency identical to the frequency of the said input pulses; and

sine wave shaping means to convert the said first triangular wave to the desired sine wave;

B. means for generating the said cosine wave including means for generating from the first said square wave

signal a second sawtooth signal having exactly twice the frequency of the said first sawtooth signal;

a second square wave generator which generates a second square wave signal having a positive excursion corresponding to one-half of the said second sawtooth signal and having a negative excursion corresponding to the other half of the said second sawtooth signal;

a third square wave generator which generates a third square wave signal at twice the frequency of the said second square wave signal and 90° out of phase from the said first square wave signal;

means for integrating the said third square wave signal to produce a second triangular wave having a fundamental frequency identical to the frequency of the said input pulses and being 90° out of phase from the first triangular wave;

sine wave shaping means to convert the said triangular wave to the desired cosine wave; and

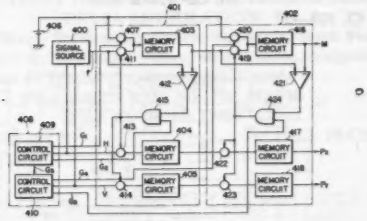
comparison means for comparing the said first square wave signal with the said second square wave signal to maintain the desired phase relationship between the third square wave signal and the first square wave signal.

4,044,311

FEATURE EXTRACTION SYSTEM FOR EXTRACTING A PREDETERMINED FEATURE FROM A SIGNAL

Seiji Kashioka, Kokubunji; Masayoshi Kameyama, Sagamihara; Masakazu Ejiri, Tokorozawa, and Takahumi Miyatake, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 13, 1976, Ser. No. 648,711
Claims priority, application Japan, Jan. 16, 1975, 50-6276
Int. Cl.² H03B *1/00*
U.S. Cl. 328—139 **15 Claims**



1. A feature extraction system for extracting a predetermined feature from a signal comprising:

first means, to which said signal is applied for extracting sequentially said predetermined feature from said signal during a predetermined time period and for storing the extracted predetermined feature in said time period, said first means extracting said predetermined feature during every predetermined time period;

second means coupled with said first means, for extracting an optimum predetermined feature from the predetermined features extracted by said second means and for storing said optimum predetermined feature, said second means being so designed that the contents stored therein are held for a long period of time in comparison with that stored in said first means; and

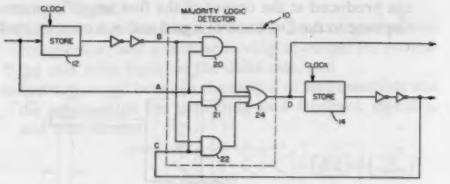
third means coupled with said second and first means for controlling said second and first means to extract said predetermined feature from said signal and then to transfer the contents of said first means to said second means at the end portion of the predetermined time period.

4,044,312

COMPARISON CIRCUIT FOR REMOVING POSSIBLY FALSE SIGNALS FROM A DIGITAL BIT STREAM

Remo J. D'Ortenzio, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Nov. 26, 1976, Ser. No. 745,442
Int. Cl.² H03K *1/10*
U.S. Cl. 328—165 **3 Claims**



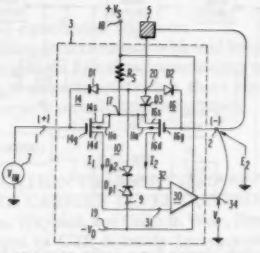
1. A comparison circuit for removing possibly false signals from a digital bit stream comprising first and second stores each capable of storing one frame of a selected bit stream, comparison means for producing an instantaneous output signal corresponding to the states of a majority of three input signals, means for applying the selected bit stream to said comparison means and simultaneously to said first store, means for applying the output of said comparison means to said second store, and means for applying the outputs of both said first and second stores to said comparison means.

4,044,313

PROTECTIVE NETWORK FOR AN INSULATED-GATE FIELD-EFFECT (IGFET) DIFFERENTIAL AMPLIFIER

Harold Allen Wittlinger, Pennington, N.J., and Michael Scott Fisher, Farmers Branch, Tex., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 1, 1976, Ser. No. 746,214
Int. Cl.² H03F *3/45;* H02H *3/20*
U.S. Cl. 330—207 P **8 Claims**



4. In combination with an amplifier having first aand second input terminals to which are connected the gates of first and second insulated gate field effect transistors (IGFETs) respectively, and wherein first and second rectifying junctions are connected back to back between said gates, the improvement comprising:

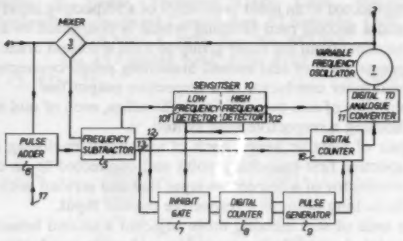
means for applying an input signal to one of said first and second input terminals; and

means for short circuiting the rectifying junction connected to the other one of said first and second terminals.

4,044,314
FREQUENCY SYNTHESIZERS

Boleslaw Marian Sosin, Chelmsford, England, assignor to The Marconi Company Limited, England

Filed July 28, 1972, Ser. No. 276,094
Claims priority, application United Kingdom, Sept. 28, 1971, 45024/71
Int. Cl.² H03B 3/04
U.S. Cl. 331—1 A 18 Claims

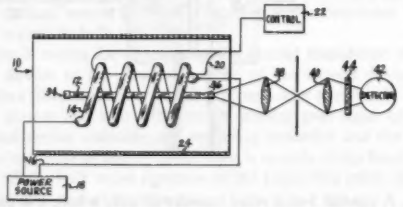


1. A frequency synthesizer including a variable frequency oscillator; comparison means for deriving a first control signal representative of a departure of the output frequency of the frequency synthesizer from a desired output frequency; control means dependent on said first control signal for controlling said variable frequency oscillator to reduce said departure; means for determining whether the first control signal results from a drift in the frequency of the variable frequency oscillator; means for generating a second control signal representative of the rate of said drift to compensate for such drift and for maintaining said second control signal until a change in the rate of said drift occurs.

4,044,315
MEANS FOR PRODUCING AND AMPLIFYING OPTICAL ENERGY

Elias Snitzer, Brookfield, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Jan. 16, 1962, Ser. No. 168,012
The portion of the term of this patent subsequent to Apr. 24, 1990, has been disclaimed.
Int. Cl.² H01S 3/16
U.S. Cl. 331—94.5 F 42 Claims



1. In a laser, a solid luminescent sensitive element of Fabrey-Perot optical regenerative configuration and consisting essentially of a clear glass activated with trivalent ytterbium ions.

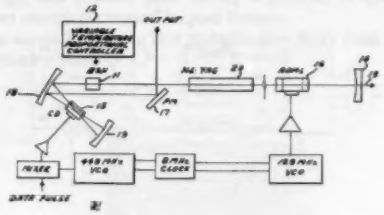
4,044,316
STABILIZED CAVITY-DUMPED ND:YAG LASER

Chandler J. Kennedy, Huntington Beach, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 19, 1976, Ser. No. 678,506
Int. Cl.² H01S 3/13
U.S. Cl. 331—94.5 S 3 Claims

1. In a cavity dumped, solid state laser having an optical cavity with circulating power of a fundamental frequency and wherein the laser output frequency is only at said fundamental frequency, said laser having a solid state laser element in said optical cavity, an improvement for decreasing relaxation oscillations associated with dumping, wherein said improvement comprises:

a. a second harmonic generation crystal for generating second harmonic power from said fundamental frequency



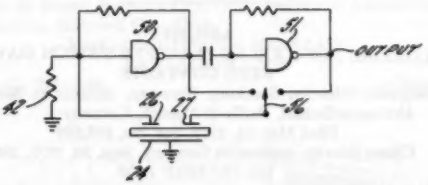
circulating power positioned in said optical cavity in intercepting relationship with said fundamental circulating power; and

b. means for controlling the temperature of said second harmonic generation crystal to provide a second harmonic power of approximately 0.05% to 0.1% of said fundamental frequency circulating power, whereby relaxation oscillations associated with dumping are decreased.

4,044,317
CRYSTAL CONTROLLED SQUARE WAVE OSCILLATOR

Darrell E. Newell, Yorkville; John F. Jennings, Chicago; Steven Lyle Fritsch, Earlville, and Howard D. Hinnah, Sandwich, all of Ill., assignors to CTS Corporation, Elkhart, Ind.

Filed Oct. 18, 1976, Ser. No. 733,210
Int. Cl.² H03B 5/36
U.S. Cl. 331—116 R 14 Claims



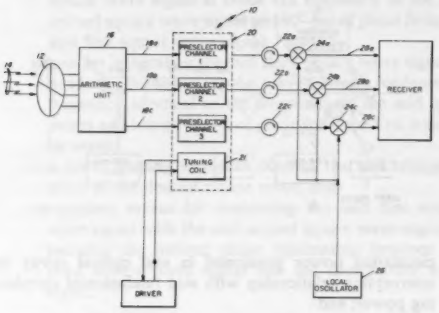
1. A square wave crystal controlled oscillator comprising a quartz crystal monolithic dual resonator having a pair of signal electrodes and a reference electrode cooperating therewith, integrated circuit logic gate means having an input coupled to one of said signal electrodes and an output coupled to the other of said signal electrodes, said resonator operating as an acoustic transformer wherein said electrodes form high Q series resonant input and output circuits acoustically coupled to resonate in symmetric and anti-symmetric modes at related frequencies, said logic gate means introducing a phase shift between said signal electrodes to cause said resonator to oscillate in a predetermined one of said modes and being of the type having a transistor input structure and a transistor output structure wherein conductive transistors in the output structure produce both high and low output states, thereby to provide low impedance drive to the resonator so as to avoid any substantial degradation of the Q of said resonator.

4,044,318

GANGED RADIO FREQUENCY FILTER

Edward J. Daly, Sudbury; Richard Sparks, Bedford, and George R. Spencer, Needham, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 20, 1975, Ser. No. 579,165
Int. Cl.[2] G01S 9/02; H01P 1/20
U.S. Cl. 333—1 6 Claims



1. In a monopulse receiver wherein radio frequency energy received by an antenna is passed through an arithmetic unit to form, in a different one of three separate channels, a sum and two difference radio frequency signals, the improvement comprising:

a. an electrically tunable filter arrangement having a separate filter in each different one of the three separate channels, each one of said separate filters having substantially the same insertion loss and frequency response characteristics;

b. means for tuning, over a preselected band of radio frequencies, each separate filter to correspond with the frequency of a desired portion of the radio frequency energy received by the antenna; and

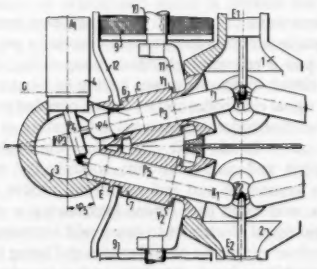
c. means for adjusting the bandpass response of each separate filter so that each of the separate filters phase and amplitude track each other.

4,044,319

COAXIAL 2-OF-n RELAY TRANSFER SWITCH HAVING REED CONTACTS

Siegfried Seinecke, Soecking, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 21, 1976, Ser. No. 688,889
Claims priority, application Germany, Sept. 30, 1975, 2543675
Int. Cl.[2] H01P 1/10
U.S. Cl. 333—7 R 8 Claims



1. A coaxial 2-of-*n* relay transfer switch arrangement, where *n* is an integer comprising

first and second coaxial input lines and *n* coaxial output lines each including an inner conductor and an outer conductor,

first and second groups of reed switches, each group including *n* reed switches arranged generally in the shape of a star with said reed switches forming the edges of a pyramid,

each of said reed switches including reed contacts, a first reed terminal connected in common with the like terminals in the same group to form two first branching points, one for each of said groups, each first branching point connected to an inner conductor of a respective input line, and a second reed terminal which is connected to a like terminal from the other group to form *n* second branching points, each of said second branching points connected to said inner conductor of a respective output line,

a plurality of non-magnetic metallic tubes, each of said tubes housing a respective reed switch,

a pair of metallic heads, each of said heads enclosing a respective first branching point and connected to an outer conductor of a respective input line and serving with that branching point as a respective coaxial input,

the ends of said metallic tubes adjacent a second branching point electrically connected to said outer conductor of a respective output line and serving with the respective branching point as a coaxial output,

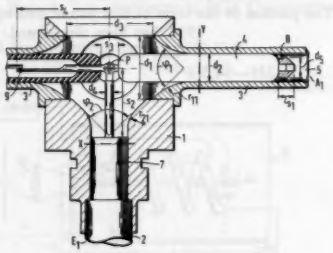
said metallic tube and metallic heads electrically connected and including interior constructions which electrically add inductance between said input line inner conductors and said first branching points and between said first branching points and the respective reed contacts in each group.

4,044,320

COAXIAL 1-OF-n RELAY TRANSFER SWITCH HAVING REED CONTACTS

Siegfried Seinecke, Soecking, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 21, 1976, Ser. No. 688,888
Claims priority, application Germany, Sept. 30, 1975, 2543669
Int. Cl.[2] H01P 1/10
U.S. Cl. 333—7 R 6 Claims



1. A coaxial 1-of-*n* relay transfer switch, where *n* is an integer, comprising

an input coaxial line and *n* output coaxial lines, each coaxial line including an inner conductor and an outer conductor,

n reed switches arranged in a star configuration and each including reed contacts and first and second reed terminals, said first reed terminals connected together to form a branching point, said branching point connected to said inner conductor of said input line and having a capacitive loading which is dependent on the number of open reed switches connected to said branching point,

n metallic, non-magnetic tubes each enclosing a respective reed switch and connected to an outer conductor of a respective output line, and

a metallic head electrically connected to said tubes and to said outer conductor of said input line, said head enclosing said branching point,

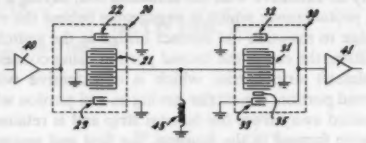
the interior walls of said head and tubes constructed to add inductance between said inner conductor of said coaxial input line and said branching point and between said branching point and said reed contacts to reduce the capacitive loading effect and form a low pass T filter section.

4,044,321

SURFACE ACOUSTIC WAVE BAND PASS FILTERING

Carmine F. Vasile, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 1, 1976, Ser. No. 662,761
Int. Cl.[2] H03H *9/04, 9/26, 9/32, 9/30*
U.S. Cl. 333—72 37 Claims



1. A band pass filter for h.f. electrical signals, comprising:

a first acoustic surface wave device, having at least two transducers coupled to each other by a piezoelectric body, a first one of the two transducers receiving an electrical signal, the other of the two transducers generating an electrical signal in response to surface waves generated by the first transducer and transmitted by the piezoelectric body, the device having a particular frequency response which includes a particular pass band on account of the signal transmission through surface waves, the device having an additional frequency band outside of the said pass band on account of bulk waves;

a second acoustic surface wave device having at least two transducers coupled to each other by a piezoelectric body, a first one of the two transducers of the second device receiving an electrical signal, the other one of the two transducers of the second device generating an electrical signal in response to surface waves generated by the first transducer of the second device and transmitted by the piezoelectric body thereof, said second device having a substantially similar frequency response and a substantially similar pass band as said first device with regard to surface waves but differing frequency responses with regard to bulk waves; and

circuit means for connecting the second transducer of the first device to the first transducer of the second device to obtain a filter cascade in which said particular pass band of said first device and said substantially similar pass band of said second device coincide and are being cascaded and the bulk wave response of one of the devices is outside of the band pass and off the bulk wave response of the respective other one of the devices and vice versa.

4,044,322

ELECTROMAGNETIC SOLENOID RELAY ASSEMBLY AND ELECTRICAL CONNECTION MEANS THEREFOR

Samuel J. Brown, South Lyon; Gideon A. DuRocher, Mount Clemens, and Gerald L. McClure, Warren, all of Mich., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed July 9, 1976, Ser. No. 703,888
Int. Cl.[2] H01H *67/02*
U.S. Cl. 335—131 4 Claims

1. An electromagnetic solenoid relay assembly comprising:

an electromagnetic coil assembly including a spool-like bobbin having a bore extending axially therethrough, first and second end flanges on said bobbin, and an electromagnetic coil wound upon said bobbin;

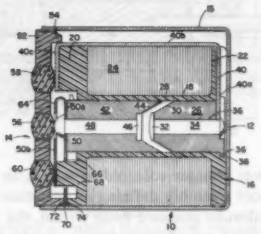
a stationary core member occupying a first end of said bore and secured to said bobbin;

a movable core member slidably located in said bore for movement toward and away from said stationary core member;

electrical contacts on the opposing faces of said stationary and movable cores;

an insulative pressure plate attached to said second end flange, said pressure plate having a plurality of spaced apart electrical contacts located thereon;

spring means for biasing said movable core away from said stationary core;



electrically conductive means for electrically connecting the contact on said stationary core member with one of the electrical contacts on said insulative pressure plate;

said spring means being electrically connected to another one of the electrical contacts on said insulative pressure plate;

electrically conductive means connecting said spring means with the electrical contact on said movable core member; and

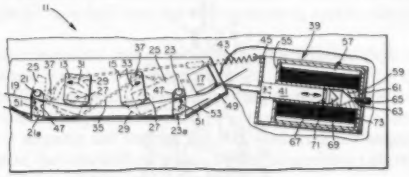
the leads of said electromagnetic coil being connected to electrical contacts on said insulative pressure plate.

4,044,323

DAMPED SOLENOID

Roger R. Sleger, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed May 3, 1976, Ser. No. 682,455
Int. Cl.[2] H01H *51/08*
U.S. Cl. 335—240 5 Claims



1. A damped solenoid, comprising:

a first magnetizable member having an opening formed therein and a second magnetic movable member fitting within said opening, together with means for magnetizing said first member to move said second member between first and second positions with respect to said first member;

said first member and said second member having confronting portions defining a chamber vented by a restricted orifice; and

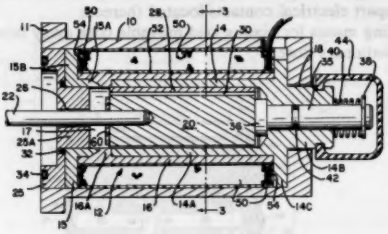
pressure sealing means disposed between said first member and said second member to ensure control of the operating speed of said solenoid by said restricted orifice.

4,044,324

COIL COMPRESSED PLUNGER CAVITY COMPONENTS FOR A WET TYPE SOLENOID

George Thom. Coors, Tipp City, Ohio, assignor to Ledex, Inc., Dayton, Ohio

Filed Apr. 30, 1976, Ser. No. 682,125
Int. Cl.[2] H01F 7/08
U.S. Cl. 335—260 6 Claims



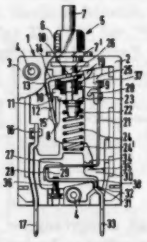
1. In a wet plunger solenoid in which an armature moves within a spool assembly defining an armature cavity subject to extreme hydraulic pressure from within, the improvement for reinforcing said assembly comprising a magnetic base having an inside surface forming at least an axial portion of the wall of said cavity, a sleeve of non-magnetic material fitted in telescopic relation to at least an axial portion of said base and having an outside coil receiving surface, a pole having a portion thereof telescopically received within said sleeve, and an electric coil wound in tension directly on said sleeve outside surface to cause said sleeve to be compressed about said base and pole for increasing the resistance of said assembly against deformation due to hydraulic pressure within.

4,044,325

PUSHBUTTON ACTUATED EXCESS CURRENT SWITCH

Fritz Krasser; Konrad Heydner, and Horst Ellenberger, all of Altdorf, Germany, assignors to Ellenberger & Poensgen GmbH, Altdorf, Germany

Filed Jan. 16, 1976, Ser. No. 649,804
Claims priority, application Germany, Jan. 23, 1975, 2502579; Mar. 14, 1975, 2511223
Int. Cl.[2] H01H 71/58
U.S. Cl. 337—66 14 Claims



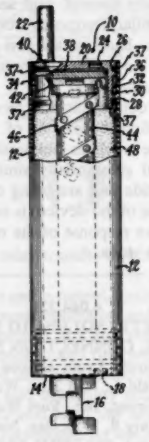
1. A pushbutton actuated excess current switch comprising:
a housing,
a pushbutton slidably mounted in said housing, an actuating rod rigidly connected to the pushbutton,
a connecting bridge rigidly connected to said actuating rod,
a driver member on said connecting bridge, two lugs on said connecting bridge,
a stud rigidly connected to the connecting bridge and pointing in a direction away from the actuating rod, said stud having a spring retaining groove,
a disconnection spring disposed between said stud and an abutment in said housing,
a contact bridge in the form of angled lever freely pivotably carried by said lugs of the connecting bridge and being displaceable in the axial direction of said actuating rod counter to the force of a second spring supported by the connecting bridge,
a dog on said angled lever being arranged to be engaged and entrained by said driver member of the connecting bridge upon switching-on,
an oblique stop in said housing against which the contact bridge is urged by the lugs upon switching-off,
a bimetal strip being directly or indirectly heated and having first and second portions extending substantially at right angles to each other, the first portion which is substantially co-extensive with the actuating rod, having a retaining protuberance which is engageable behind the contact bridge to maintain the contact bridge in the switched-on position, the end of the second portion being connected to a bimetal strip carrier which is co-extensive with the second portion, the carrier having an end portion which is directed away from the bimetal strip and is retained in a groove formed in the housing, the first and second portions of the bimetal strip are of substantially equal length, two substantially semi-circular projections disposed in the housing to retain, with free play, the second portion of the bimetal strip, the two projections being situated on an imaginary line which extends substantially parallel to the first portion and passes through the protuberance of the bimetal strip, a setscrew engageable with the bimetallic strip carrier at a position adjacent the connection to the bimetal strip, the setscrew being rotatable only relative to the housing.

4,044,326

HERMETIC SEAL BETWEEN TELESCOPING CYLINDERS OF A FUSE HOUSING

David A. Rodrigues, Pittsfield, Mass., assignor to General Electric Company

Filed Oct. 9, 1975, Ser. No. 621,017
Int. Cl.[2] H01H 85/14
U.S. Cl. 337—248 6 Claims



1. An electrical device comprising
a cylindrical housing first member
a cylindrical second member telescopingly fitted inside said housing member,
at least one resilient gasket member between the inner surface of said first member and the outer surface of said

second member, said gasket defining one end of an annular space between said first and second members, and

a settable adhesive filling said granular space and rigidly bonding together said first and second members to form an annular hermetic seal.

4,044,327
TRIMMING POTENTIOMETERS WITH COARSE AND FINE ADJUSTMENT MEANS

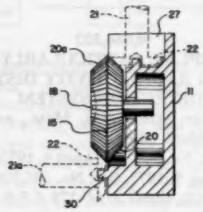
Derek Taylor, Whitstable, England, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 489,526, July 18, 1974, abandoned. This application Sept. 7, 1976, Ser. No. 721,024

Claims priority, application United Kingdom, Aug. 1, 1973, 36624/73

Int. Cl.² H01C *10/32*

U.S. Cl. 338—166 **12 Claims**



1. A potentiometer drive having a body housing a resistive member and a rotatable member attached to a wiper in contact with said resistive member for varying the position of said wiper thereon, wherein said rotatable member has a peripherally toothed portion and said body is formed with a plurality of pivot points for a rotatable adjusting tool, each of said pivot points being spaced from said periphery toothed portion of said rotatable member by less than the radius of said rotatable member, whereby a toothed adjusting tool can be engaged with any one of said pivot points and with the toothed portion of said rotatable member for adjustment of said rotatable member by rotation of the tool, said pivot points being pegs formed on said body for rotatably fitting within a bore in the nose of an adjusting tool, and being positioned to define different adjustment directions for the tool.

4,044,328
DATA CODING AND ERROR CORRECTING METHODS AND APPARATUS

Anthony P. Herff, Los Angeles, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed June 22, 1976, Ser. No. 698,570

Int. Cl.² G06F *11/10*

U.S. Cl. 340—146.1 AG **72 Claims**

1. In a method of encoding data, the improvement comprising in combination the steps of:

arranging said data in data rows;

providing a first error checking signal for said arranged data;

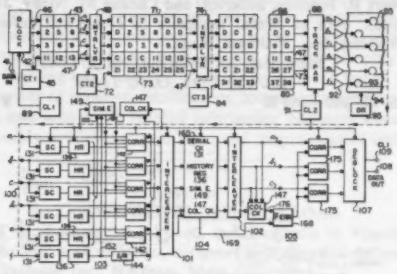
arranging said first error checking signal in a first correction row accompanying said data rows;

modifying said data in said data rows and said first error checking signal by at least one data characteristic;

providing a second error checking signal for said modified data and first error checking signal;

arranging said second error checking signal in a second correction row accompanying said data rows and first correction row; and

processing said modified data and first error checking signal



and said second error checking signal in said data rows and said first and second correction rows.

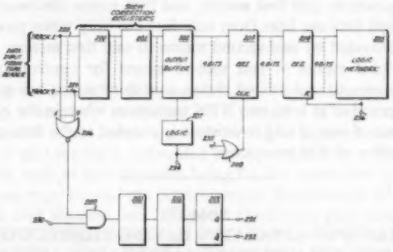
4,044,329
VARIABLE CYCLIC REDUNDANCY CHARACTER DETECTOR

Edward R. Besenfelder, and Jack L. Gooding, both of Phoenix, Ariz., assignors to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed July 2, 1976, Ser. No. 702,158

Int. Cl.² G06K *5/04*

U.S. Cl. 340—146.1 F **6 Claims**



1. A variable cyclic redundancy character detector for use in a magnetic tape unit used in a data processing system comprising:

a. discrimination means for determining whether data or a blank was read from the magnetic tape and what type coding was used in writing the data on the magnetic tape;

b. data shifting means connected to the discrimination means for aligning and shifting the data read from the magnetic tape, the data shifting means further comprising a plurality of data registers;

c. logic means connected to the data shifting means for determining if the cyclic redundancy character has been read, where it is in the data shifting means, and whether or not the cyclic redundancy character was a blank;

d. control signal means connected to the logic means for providing the necessary signals to the logic means to interpret the data being read from the magnetic tape;

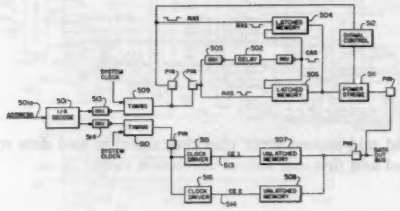
e. counting means connected to the logic means for varying the time frame for looking for the cyclic redundancy character from the magnetic tape;

f. parity checking means connected to the data shifting means for determining the validity of the data read from the magnetic tape and for generating a signal each time a byte of data is read from the data shifting means.

4,044,330
POWER STROBING TO ACHIEVE A TRI STATE

Robert B. Johnson, Billerica, and Chester M. Nibby, Jr., Peabody, both of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Mar. 30, 1976, Ser. No. 671,802
Int. Cl.[2] G11C *13/00, 11/40*
U.S. Cl. 340—166 R **9 Claims**



1. In combination with a random access memory array (RAM) having data in and data out lines and enabling means for reading/writing data in or data out of said RAM during one memory cycle of said RAM, said random access memory array (RAM) being comprised of first type memory elements whereby information is retained on said data-out lines for the duration of the memory cycle when an enabling signal on the enabling means is removed, and apparatus for uncoupling said data out lines of said RAM from a data bus comprising:

a. first means, coupled to said data out lines and said data bus for disconnecting said data out lines from said data bus during the memory cycle of said RAM;

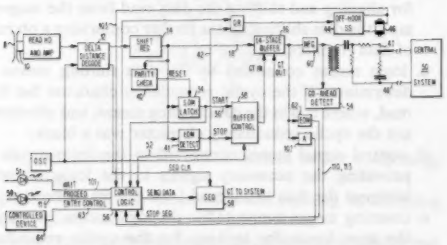
b. second means, coupled to said first means, for providing power to said first means, said first means disconnecting said data out lines from said data bus only when power is provided by said second means to said first means;

c. third means in said second means for controlling the power to said second means, said third means being comprised of at least two NPN transistors wherein the collector of one of said transistors is coupled to the base of the other of said transistors.

4,044,331
DATA INPUT APPARATUS HAVING BIDIRECTIONAL READER FOR INPUTTING ALTERNATIVE MESSAGES

Frank John Garofalo, Jr., Woodstock, and George Nathan Pardonner, Jr., Saugerties, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 16, 1973, Ser. No. 379,691
Int. Cl.[2] G06F *11/00;* **G06K** *9/18, 19/06;* **H04Q** *9/00*
U.S. Cl. 340—172.5 **8 Claims**



1. In a data entry system, a bi-directional machine code reader and a document cooperative therewith, said document including a data stripe having code manifesting means readable by said reader in opposite directions, said stripe including start of message and data message codes in a first portion thereof followed by the mirror image of said data message codes and said start of message code in a second portion thereof,

said second portion also including a control code unique to said second portion to distinguish said second portion from said first portion,

said stripe including an end of message code between said data codes and the mirror image thereof to define the boundary between said portions of said stripe,

said reader including start of message and end of message code detector means and storage means controlled thereby to store codes from whichever of said portions is encountered first by the reading of said stripe,

decoder means responsive to said storage means to detect said control code if present in the codes stored therein, and

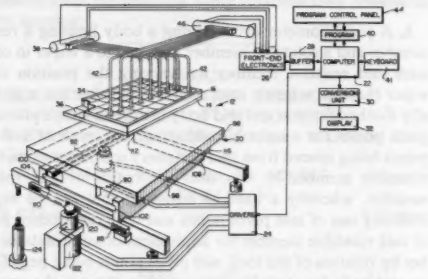
means responsive to the detection of said control code by said decoder means to generate an output signal to an external device,

said output signal being indicative that said stripe has been read from the end thereof bearing said second portion.

4,044,332
HALFTONE DISPLAY, PARTICULARLY FOR A HIGH RESOLUTION RADIOACTIVITY DISTRIBUTION DETECTION SYSTEM

Raymond P. Grenier, Wilmington, Mass., assignor to Baird-Atomic, Inc., Bedford, Mass.

Continuation of Ser. No. 348,993, April 9, 1973. This application June 9, 1975, Ser. No. 585,329
Int. Cl.[2] G01T *1/20;* **G06G** *3/14;* **178** *6.7 R;6.6 R;6.6 B;6.8*
U.S. Cl. 364—900 **9 Claims**



1. A device for presenting a halftone pictorial representation of radioactivity distribution within a specimen, said device comprising:

a. means for detecting a number of radioactive events at X, Y locations within the specimen;

b. computer means operatively connected to said detecting means for generating coded signals proportional to the number of radioactive events detected at each X, Y location;

c. display means for presenting a pictorial representation comprised of a plurality of like profile picture elements, each said picture element defining a matrix having a plurality of like profile sections; and

d. conversion means operatively connected to said computer means and display means, said coded signal selectively applied to said display means via said conversion means, said conversion means generating character code signals in response to said coded signals, said character code signals representing a specified number of dot elements per unit area for each said picture element, the number of dot elements per unit area in each said picture element defining a shade in the Gray scale, said dot elements and said sections having like profiles, said pictorial representation presented by said display means being a halftone presentation of radioactivity distribution within the specimen.

4,044,333

DATA PROCESSING SWITCHING SYSTEM

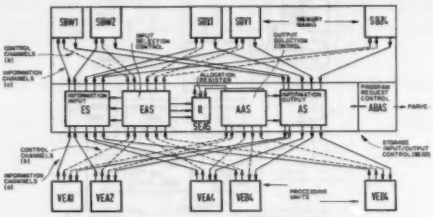
Heinz Auspurg, Gauting, and Josef Huber, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 377,129, July 6, 1973. This application Feb. 18, 1975, Ser. No. 550,610

Claims priority, application Germany, July 26, 1972, 2236718

Int. Cl.[2] G06F *13/00*

U.S. Cl. 364—200 13 Claims



1. A data processing switching system comprising a plurality of processing units, a plurality of memory banks, and a storage input/output control system governing the information traffic between said processing units and said memory banks, said storage input/output control system comprising an input circuit and an output circuit as well as an input control unit and an output control unit cooperating with said input and output circuits for establishing and controlling said information traffic over parallel information channels connecting said processing units and said memory banks via said input and output circuits, said input control unit being associated with said processing units said output control unit being associated with said memory banks,

wherein each of said plurality of processing units (VE) is selectively assigned to one group of a plurality of processing groups and each of said plurality of memory banks (SB) is selectively assigned to one group of a plurality of memory groups, the number of groups in both said plurality of processing groups and said plurality of memory groups being equal to the number of parallel information channels simultaneously available to said input and output control units for establishing and controlling traffic between the processing units and the memory banks, each of said processing units within each of said plurality of processing groups having an assigned priority of the first order relative to the other processing units in the same group in said plurality of processing groups and each of said memory banks within each of said plurality of memory groups having an assigned priority of the first order relative to the other memory banks in the same group in said plurality of memory groups, and each group in said plurality of processing groups and each group in said plurality of memory groups having an assigned priority of the second order relative to the other groups in said plurality of processing groups and said plurality of memory groups, respectively,

said plurality of processing units each including means for sending input requests to said input/output control system and said plurality of memory banks each including means for sending output requests to said input/output control system,

said input control unit and said output control unit including means for evaluating said input and output requests, respectively, during each operating interval of the input-/output control system according to the assigned priority of the plurality of processing units and plurality of memory banks, said input control unit and said output control unit each further including means for comparing said input and output requests on the basis of their respective memory bank and processing unit destinations, whereby said evaluating and comparing means enable said input-/output control system during each operating interval to simultaneously connect information channels between one or more of said plurality of processing units requesting an input and one or more of said plurality of memory banks requesting an output and their respective destinations according to the assigned priority of said plurality of processing units and said plurality of memory banks, the number of possible simultaneous connections being equal to said number of parallel information channels simultaneously available to said input and output control units.

4,044,334

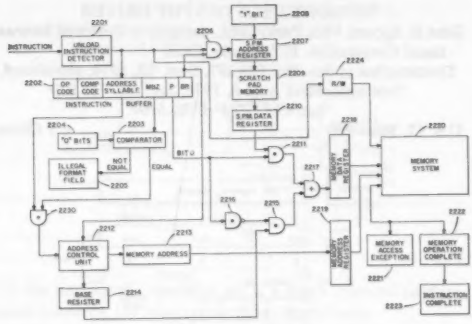
DATABASE INSTRUCTION UNLOAD

Charles W. Bachman, Lexington, and Benjamin S. Franklin, Cambridge, both of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed June 19, 1975, Ser. No. 588,522

Int. Cl.[2] G06F *9/10, 9/16, 9/20, 13/00*

U.S. Cl. 364—200 10 Claims



1. In an internally programmed data processing apparatus having a memory comprised of a plurality of segments of addressable space, each segment having a segment number, each of said segments delineated by upper and lower variable bounds, each of said segments being further subdivided into at least one page located at a predetermined displacement address within said segment and having an identifying page number, each of said pages for storing a plurality of files of database records grouped in sets of database records, each set having at least one owner record, each of said pages also including offset address information for locating any one of said database records of a selected one of said sets from a predetermined location in a selected one of said pages; said data processing apparatus also having a system base for locating relative to said system base the absolute address of predetermined ones of said segments, pages and database records; said data processing apparatus further having an index register for storing a selected database-index address comprised of a database pointer address for forming a next address of a predetermined one of said database records, each of said database records having at least one of said database pointers comprised of an area, page and line address, said area address for locating a predetermined file of said database records, said page address for locating a predetermined group of said database records within said file, and said line address for locating a predetermined one of said database records; instruction hardware, responsive to an unload instruction having an address syllable, for unloading said database pointer from said index register and placing it in said database record, comprising:

a. first means coupled to be responsive to said database pointer address stored in said index register for converting said database pointer address to an equivalent segmented number of a segment storing a selected one of said database records in a selected one of said sets;

b. second means coupled to be responsive to said first means and said address syllable register in said unload instruction register for storing a displacement address of said selected one of said database records from a predetermined address in said segment;

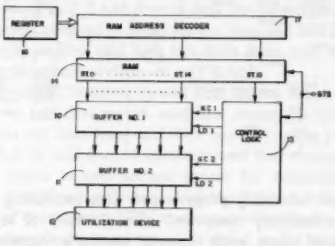
c. third means coupled to be responsive to said first and second means for generating an absolute address of said selected one of said database records in said memory; and,

d. fourth means coupled to be responsive to said first, second and third means for transferring said database pointer address stored in said index register into said selected one of said database records.

4,044,335
MEMORY CELL OUTPUT DRIVER

John R. Spence, Villa Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 508,297, Sept. 23, 1974, abandoned.
This application Aug. 9, 1976, Ser. No. 713,029
Int. Cl.[2] G06F *3/00, 5/04*
U.S. Cl. 364—900 7 Claims



1. In combination,

first memory means for receiving and storing information therein,

said first memory means comprising a plurality of memory cells, each of said memory cells having respective input and output means,

second memory means for receiving and storing the information from said first memory means,

said second memory means comprising a plurality of memory cells, each of said memory cells having respective input and output means, the respective output means of said memory cells comprising said first memory means connected to the respective input means of the memory cells comprising said second memory means,

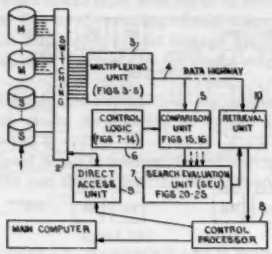
first control means connected to said first memory means to selectively address the plurality of memory cells comprising said first memory means to selectively enable each of said memory cells to receive information one at a time, said first control means generating a load-complete signal indicating that information entry into the memory cells comprising said first memory means is complete, and

second control means connected to each of said first and second memory means and responsive to said load-complete signal of said first control means to control transferring the information that is stored in said first memory means to said second memory means and to control clearing said second memory means prior to permitting said information to be received by and stored in said second memory means.

4,044,336
FILE SEARCHING SYSTEM WITH VARIABLE RECORD BOUNDARIES

Edward Babb, Stevenage, England, assignor to International Computers Limited, Stevenage, England

Filed Aug. 6, 1975, Ser. No. 602,274
Claims priority, application United Kingdom, Feb. 21, 1975, 7291/75
Int. Cl.[2] G06F *15/40, 13/00*
U.S. Cl. 364—900 3 Claims



1. A data processing system comprising:

a. a data store holding a plurality of groups of data, each group being terminated by a data item having one of a plurality of different values;

b. a plurality of key stores holding a plurality of search keys;

c. a plurality of comparison means connected in parallel to receive data from the data store, for comparing the data with respective ones of the search keys to produce a plurality of comparison result signals;

d. a writable store containing a threshold value;

e. end-of-record detection means connected to receive data from the store concurrently with the reception of that data by the comparison means, for comparing each said data item which terminates a group of data with said threshold value to produce an end-of-record signal when this comparison produces a predetermined result; and

f. processing means connected to receive said comparison result signals from the comparison means and responsive to said end-of-record signal to form a predetermined logical combination of said comparison result signals, thereby indicating whether the data satisfies a predetermined search criterion.

4,044,337
INSTRUCTION RETRY MECHANISM FOR A DATA PROCESSING SYSTEM

Glen LeRoy Hicks, Endwell; Leland Delmar Howe, Jr., Owego, and Frank Anthony Zurla, Jr., Binghamton, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1975, Ser. No. 643,998
Int. Cl.[2] G06F *11/00*
U.S. Cl. 364—200 10 Claims

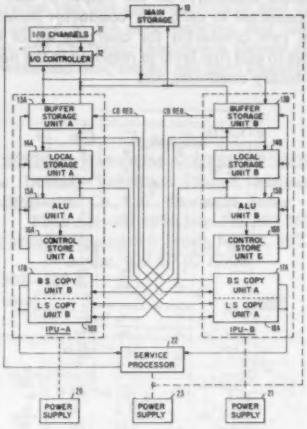
1. In a data processing system having a data store and address circuitry for accessing such data store, the combination comprising:

a copy store system having a set of at least two separately addressable copy storage locations for each of a plurality of data store addresses;

circuitry for supplying to the copy store system the same data as is supplied to the data store for storage therein;

and copy store address circuitry responsive to the address supplied to the data store address circuitry for controlling the address at which the data is copied in the copy store system, such copy store address circuitry including cir-

cuitry for causing data stored at the same data store address during different data processing instruction cycles to



be alternately copied into different ones of the copy storage locations in the same copy store set.

4,044,338

ASSOCIATIVE MEMORY HAVING SEPARATELY ASSOCIABLE ZONES

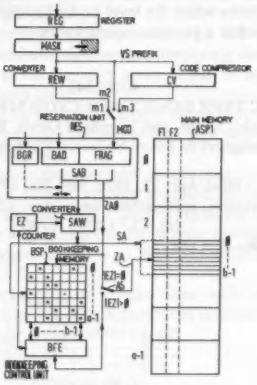
Gerhard Wolf, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 2, 1976, Ser. No. 654,615

Claims priority, application Germany, Feb. 10, 1975, 2505477

Int. Cl.[2] G06F *13/00*; G11C *15/00*

U.S. Cl. 340—172.5 **4 Claims**



1. In an associative memory of the type wherein there are separately associable zones, a linearly addressable main memory for input and read out of data consisting of an associative component and a non-associative component, a comparator for comparing the read-out association words with the search word, a device including address converters for deriving addresses from at least the higher-value bits of association and search words, and an extension counter connected to the address converters whose count influences the derivation of the addresses and whose count is increased by one in response to an initially addressed storage position being occupied, the improvement therein comprising:

a reservation unit connected in front of said device which includes said address converters, said reservation unit including a shift network for receiving zone delimiting control information and a selected part of the lower-value bits of a zone address and a fragment which is a selected part of the higher-value bits of a primary bit group having a width 1 and derived from the association and search words, and responsive thereto to derive and provide said device including address converters with a secondary bit group having a width 1 of a complete address in order for the address converters to provide, in conjunction with said extension counter, a memory address.

4,044,339

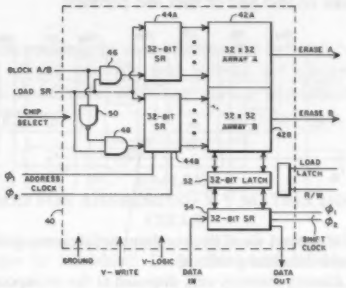
BLOCK ORIENTED RANDOM ACCESS MEMORY

Robert O. Berg, Roseville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 15, 1975, Ser. No. 641,044

Int. Cl.[2] G11C *8/00*

U.S. Cl. 340—173 R **3 Claims**



1. An integrated circuit for use in a block oriented random access memory, the integrated circuit comprising:

a memory block for storing a plurality of words, the memory block comprising an N × M memory array having N words of M bits each;

terminal means for receiving block select signals;

sequential addressing means associated with the memory block for sequentially addressing each word of the memory block in a predetermined order when the memory block is selected, the sequential addressing means comprising an N bit shift register wherein each bit of the N bit shift register is connected to one of the N words of the N × M memory array and wherein each word of the N × M memory array is addressed when the bit of the N bit shift register to which it is connected attains a first level;

loading means for loading a signal of the first level in one end of the N bit shift register when the memory block is selected, and wherein the shift register is adapted to receive clock signals and to shift sequentially the signal of the first level from the one end of the N bit shift register to an opposite end, and then off the end, in response to the clock signals, whereby each word of the memory block is sequentially addressed in a predetermined order;

data input means for entering data into each addressed word in response to an input signal; and

data output means for reading out data from each addressed word in response to an output signal.

4,044,340

SEMICONDUCTOR MEMORY

Kiyoo Itoh, Higashi-kurume, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 29, 1975, Ser. No. 645,306

Claims priority, application Japan, Dec. 25, 1974, 49-148056

Int. Cl.[2] G11C *11/40*

U.S. Cl. 340—173 R **17 Claims**

14. A random access semiconductor memory comprising:

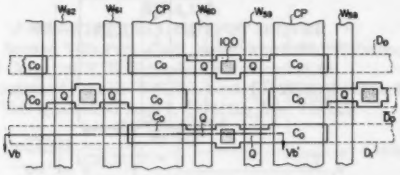
first and second data line portions disposed parallel and adjacent to each other

a plurality of first word lines orthogonally crossing over each of said data line portions;

a plurality of memory cells, disposed at the cross points of said first word lines and one of said data line portions, each of which memory cells is capable of storing selected information to be written therein and is capable of reading out information stored therein, each memory cell having an address terminal connected to a respective word line so that each word line is connected to the address terminal of only one memory cell, and having a data terminal connected to one of said data line portions;

a differential amplifier connected to each of said data line portions for differentially amplifying signals supplied thereby;

means, connected to said differential amplifier and said data line portions, for deriving output signals representative of signals on said pair of data line portions;



a pair of second word lines orthogonally crossing over each of said data line portions;

a first dummy memory cell, disposed at the crosspoint of one of said second word lines and said first data line, and being capable of storing selected information to be written therein, and being capable of reading out information stored therein, and having an address terminal connected to said one of said second word lines, and having a data terminal connected to said first data line portion; and

a second dummy memory cell, disposed at the crosspoint of the other of said second word lines and said second data line, and being capable of storing selected information to be written therein, and being capable of reading out information stored therein, and having an address terminal connected to said other of said second word lines, and having a data terminal connected to said second data line portion.

4,044,341

MEMORY ARRAY

Roger Green Stewart, Neshanic Station, and Joel Roy Oberman, Somerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 22, 1976, Ser. No. 668,909
Int. Cl.[2] G11C *11/00*
U.S. Cl. 340—173 R **9 Claims**

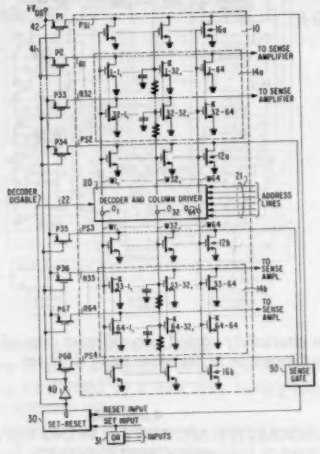
1. The combination comprising:

a matrix array of row and column conductors, the intersection of each row and column conductor defining a bit location and each bit location storing binary data; said array being characterized in that corresponding to the enabling of a column conductor, the row conductors remain charged at a first level or are placed at a second level depending on the value of the binary data at the intersection of a row and the enabled column;

an additional row conductor storing the same binary data at every one of its bit locations of a value for placing said row conductor at said second level each time a column conductor is enabled;

a set-reset circuit having input means; and an output; said circuit being responsive to a set signal at its input means for setting and maintaining its output at a first binary condition, and responsive to a reset signal at its input means for setting and maintaining its output at the other binary condition;

charging means responsive to the output of said set-reset circuit, connected to each row conductor including said additional row conductor for charging all of said row conductors to said first level in response to the presence of said first binary condition; and



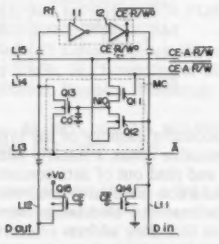
sensing means having an input connected to said additional row conductor and having an output connected to said input means of said set-reset circuit, said sensing means being responsive to the level to which said additional row conductor is charged and producing a reset signal to said set-reset circuit for terminating the charging of said row conductors when the level on said additional row conductor reaches a predetermined value.

4,044,342

DYNAMIC TYPE SEMICONDUCTOR MEMORY DEVICE

Yasoji Suzuki, Ayase, and Kiyofumi Ochii, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Apr. 22, 1976, Ser. No. 679,177
Claims priority, application Japan, Apr. 22, 1975, 50-48953
Int. Cl.[2] G11C *11/40*
U.S. Cl. 340—173 DR **13 Claims**



1. A dynamic type semiconductor memory device comprising a refresh circuit, a plurality of semiconductor memory cells which are connected across a data input line and a data output line, a plurality of read/write command signal line and a plurality of word selection lines which are provided for each of said semiconductor memory cells, each of said semiconductor memory cells comprises serially connected first and second transistors of the opposite polarity, the gate electrodes of said

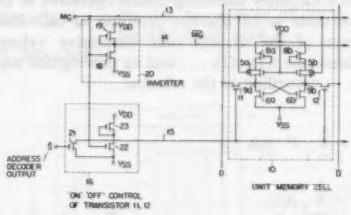
first and second transistors being connected to said read/write command signal line and said data input line, respectively, a third transistor connected across said data output line and said word selection line, the gate electrode of said third transistor being connected to the node between said first and second transistors, and a parasitic capacitance formed as the common node between said first, second and third transistors for storing data.

4,044,343

NON-VOLATILE RANDOM ACCESS MEMORY SYSTEM

Yukimasa Uchida, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 29, 1976, Ser. No. 681,557
Claims priority, application Japan, May 2, 1975, 50-52494
Int. Cl.² G11C *11/40*
U.S. Cl. 340—173 R **4 Claims**



1. A random access non-volatile memory system comprising:

a memory array circuit having a plurality of unit non-volatile memory cells arranged in a matrix array, each unit non-volatile memory cell including a volatile binary logic circuit and a non-volatile semiconductor memory element into which a data in the volatile binary logic circuit is written and from which the data written is transferred to the binary logic circuit;

cell selecting means including a decoder for decoding a plurality of address signals, and supplying the output of the decoder to the memory array circuit to select one of the unit memory cells;

a data input and output circuit supplying an input data to the selected unit memory cell and delivering a data read out of the unit memory cell;

a voltage variation detector circuit adapted to detect the variation of a source voltage supplied to the memory array circuit and generate a control signal for controlling, according to a detected output, a data transfer between the binary logic circuit and the non-volatile memory element; and

means for interrupting in synchronism with the control signal a data transfer path between the selected unit memory cell and the input-output circuit.

4,044,344

METHOD OF AND APPARATUS FOR MEASURING INFORMATION HOLD TIME OF MEMORY CELL IN DYNAMIC MIS MEMORY

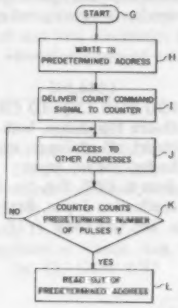
Hidetsugu Wada, Kokubunji; Yoichi Asano, Tokyo, and Yoshikazu Suzumura, Fuchu, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 12, 1976, Ser. No. 685,808
Claims priority, application Japan, May 28, 1975, 50-62901
Int. Cl.² G11C *11/40, 7/06*
U.S. Cl. 340—173 DR **2 Claims**

1. A method of measuring the information hold time of memory cell in a MIS dynamic memory having a plurality of memory cells, comprising the steps of:

writing and storing information in a memory cell at a predetermined address of said memory;

carrying out the access to other plural addresses for a fixed time period without refreshing said memory cell of said predetermined address; and



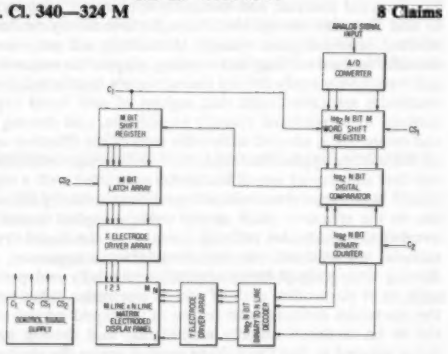
thereafter reading the stored information out of said memory cell of said predetermined address and comparing the level of the read information with a predetermined threshold value.

4,044,345

METHOD FOR ADDRESSING X-Y MATRIX DISPLAY CELLS

Fumio Ueda, and Hirotsugu Arai, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 453,065, March 20, 1974. This application Oct. 21, 1975, Ser. No. 624,427
The portion of the term of this patent subsequent to Nov. 25, 1992, has been disclaimed.
Int. Cl.² G06F *3/14*
U.S. Cl. 340—324 M **8 Claims**


ANALOG SIGNAL INPUT
A/D CONVERTER
M BIT SHIFT REGISTER
log2 N BIT M WORD SHIFT REGISTER
M BIT LATCH ARRAY
log2 N BIT DIGITAL COMPARATOR
X ELECTRODE DRIVER ARRAY
log2 N BIT BINARY COUNTER
M LINE x N LINE MATRIX ELECTRODED DISPLAY PANEL
Y ELECTRODE DRIVER ARRAY
log2 N BIT BINARY CODE DECODER
CONTROL TRIGGER SUPPLY

1. A matrix addressing method for a group of X-Y matrix display cells having an X_i-Y_j two-dimensional matrix electrode structure (where i equals 1,2,3, . . . , M, and j equals 1,2,3, . . . , N) during an N time frame period comprising the steps of:

applying an X_i-electrode voltage e_{Xi} having a binary value of one or zero to the 1,2,3, . . . , M electrodes in such a manner that predetermined number of binary is applied during each time frame;

applying a Y_j-electrode voltage e_{Yj} having a binary value of one or zero sequentially to the 1,2,3, . . . , N Y_j electrodes in such a manner that a binary one is only applied to the first electrode during the first time frame, a binary one is only applied to the second electrode during the second time frame, a binary one is only applied to the third electrode during the third time frame, . . . , and a binary one is

only applied to the Nth electrode during the Nth time frame; and

addressing matrix display cells P_{ij} in response to the timing at which the electrode voltages e_{Xi} and e_{Yj} assume individual binary states.

4,044,346

DRIVING METHOD FOR LIQUID CRYSTAL DISPLAY

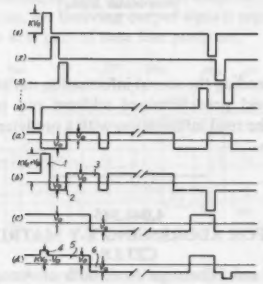
Masao Akahane; Minoru Hosokawa, both of Suwa, and Kanemitsu Kubota, Shiojiri, all of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed June 6, 1975, Ser. No. 584,310

Claims priority, application Japan, June 6, 1974, 49-64205

Int. Cl.[2] G02F *1/13*

U.S. Cl. 340—336 **11 Claims**



1. A liquid crystal display having first and second sets of electrodes; liquid crystal material; means supporting said first and second sets of electrodes on opposed sides of said liquid crystal material to define, by overlapping regions of said first and second sets of electrodes, a plurality of regions of said liquid crystal material; and means for applying driving signals to said first and second electrodes for selectively rendering selected of said regions visually identifiable and not visually identifiable, said driving means being adapted to sequentially and repetitively apply driving timing signals to selected of said electrodes associated with said regions of said liquid crystal material to be rendered visually identifiable, said driving circuit means being adapted so that the ratio of the effective value of the voltage applied between the overlapping electrodes of said first and second sets of electrodes associated with a region of said liquid crystal material to be rendered visually identifiable, to the effective value of the voltage applied across the overlapping electrodes defining a region of the liquid crystal material not rendered visually identifiable, is maximum, said driving timing signal being applied sequentially and periodically to N electrodes, each of said N electrodes being one of the electrodes defining each region of the liquid crystal material to be rendered visually identifiable, said driving means being adapted so that the voltage applied across the electrodes defining each region of the liquid crystal material to be rendered visually identifiable is $(\sqrt{N} + 1)$ times as high as the voltage applied across a region of liquid crystal material not rendered visually identifiable.

4,044,347

VARIABLE-LENGTH TO FIXED-LENGTH CONVERSION OF MINIMUM-REDUNDANCY CODES

David Curtis Van Voorhis, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

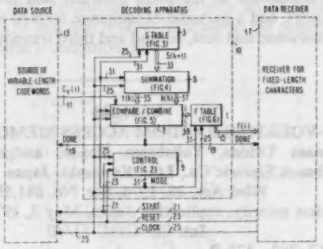
Filed May 19, 1975, Ser. No. 578,959

Int. Cl.[2] H03K *13/24*

U.S. Cl. 340—347 DD **13 Claims**

1. Apparatus for converting the code words of variable length codes into corresponding fixed-length characters, comprising:

a table storage for storing two tables, a first table containing the fixed-length characters, and a second table whose values $s(1)$, $s(2)$, . . . uniquely identify the variable length code;



summation circuitry including means operative as the successive code word bits are received to calculate from elements of the second table successive values of a weighted sum $t(1)$, $t(2)$, . . . and an unweighted sum $b(1)$, $b(2)$, . . . according to the relation:

$$t(k) = \sum_{j=1}^{k} 2^{k-j} s(j),$$

$$b(k) = \sum_{j=1}^{k} s(j);$$

compare/combine circuitry adapted to accept as input the successive bits of a code word to be converted into its corresponding fixed character, connected to said summation circuitry, responsive to the successive values of said weighted sum to isolate the bits comprising the code word;

said compare/combine circuitry further including means for adding said code word to the unweighted sum and subtracting the weighted sum to provide a fixed-length integer; and

means responsive to said integer to index said table of fixed-length characters.

4,044,348

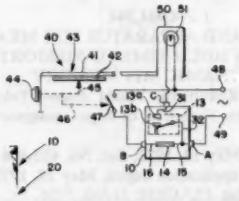
CIRCUIT ENERGIZATION INDICATOR WITH THERMAL TIMING MEANS TO MAINTAIN THE INDICATION FOR A PREDETERMINED TIME AFTER DE-ENERGIZATION

Richard G. Huebscher, Cleveland, Ohio, assignor to Gould Inc., Chicago, Ill.

Filed Sept. 22, 1975, Ser. No. 615,566

Int. Cl.[2] H01H *37/08, 61/02*

U.S. Cl. 340—227.1 **23 Claims**



1. A thermal timer, comprising storage means for storing thermal energy in a thermally insulative environment having a predetermined thermal energy leakage rate, supply means for supplying thermal energy to said storage means to change the temperature of the latter from one to another temperature, and thermally responsive output means for producing a distin-

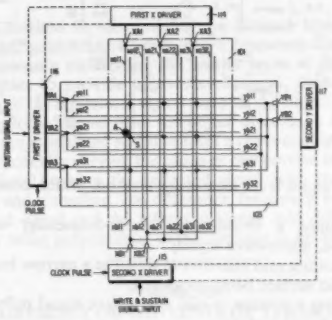
guishable output in response to the temperature thereof, said output means being positioned relative to said supply means to produce such distinguishable output promptly upon the initiation of the latter to supply such thermal energy, and said output means also being positioned relative to said storage means to produce such distinguishable output in response to and generally indicative of the temperature of said storage means after said supply means ceases to supply such thermal energy, the duration of continued production of such distinguishable output after termination of a supply of thermal energy by said supply means to said storage means being proportional to such thermal leakage rate.

4,044,349

GAS DISCHARGE PANEL AND METHOD FOR DRIVING THE SAME

Shizuo Andoh, and Norihiko Nakayama, both of Kobe, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sept. 20, 1974, Ser. No. 507,797
Claims priority, application Japan, Sept. 21, 1973, 48-106730
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 M **6 Claims**



1. A method of driving a gas discharge panel having first and second substrates disposed in spaced, parallel relationship and sealed to confine an ionizable gas therebetween, first and second sets of plural electrode pairs supported on said first and second substrates, respectively, and disposed in orthogonal relationship to establish four points of intersection between each electrode pair of said first set and each electrode pair of said second set defining respectively corresponding discharge points with addresses determined by the electrodes associated with the said points of intersection, a discharge at a given first one of said four intersection points defined by a first electrode in a given pair in each of said sets as a write-in point requiring that a voltage of a predetermined first level in excess of a firing voltage be applied to the first electrodes of said first and second sets intersecting at that point, the discharge at a given second one of said four intersection points defined by a second electrode in said given pair in each of said sets as a display point requiring that a voltage of a level less than said firing voltage be applied to the second electrodes of said first and second sets intersecting at that given display point when a discharge is produced at its corresponding given write-in point, said method comprising the steps of:

identifying a pair of electrodes of each of said first and second sets corresponding to the address of points of intersection at which a discharge is to be established;

applying a write voltage having a value greater than said firing voltage to a first electrode of the identified pair of each of said first and second sets corresponding to the addressed write-in point to establish a discharge at the write-in point of the said first electrodes of said identified pairs of said first and second sets, and

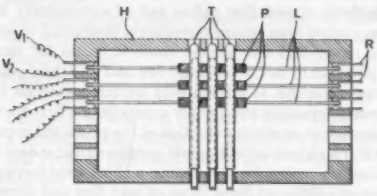
selectively applying an energizing voltage having a value less than said firing voltage to second electrodes of said identified pairs of said first and second sets thereby to establish a discharge at the display point of said second electrodes of said identified pairs of said first and second sets in accordance with the discharge established at the write-in point of said first electrodes of the respectively corresponding, identified pairs of said first and second sets.

4,044,350

ELECTROMECHANICAL TRANSDUCER FOR RELIEF DISPLAY PANEL

Oleg Tretiakoff, and Andrée Tretiakoff, both of 43 avenue Lulli, Sceaux, France (92330)

Filed Aug. 19, 1975, Ser. No. 605,853
Claims priority, application France, Aug. 22, 1974, 74.28793
Int. Cl.[2] G09F *9/32*
U.S. Cl. 340—407 **20 Claims**



1. An electromechanical transducer device comprising:

a bimorphous piezoelectric reed bendable around an axis perpendicular to the longitudinal axis of the reed on the application of a DC voltage;

support means for each end of said reed;

coupling means supported on said reed;

a rod arranged transversely to said piezoelectric reed and coupled to said coupling means;

and means for applying a DC voltage to said reed;

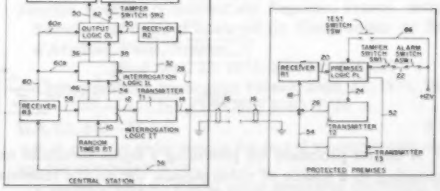
whereby on the application of said voltage the bending of the reed causes static displacement of said rod in the direction of its own longitudinal axis.

4,044,351

SYSTEM MONITOR WITH INNATE LINE SECURITY ABILITY

Evan Philip Everson, Cedar Rapids, Iowa, assignor to Walter Kidde & Company, Inc., Clifton, N.J.

Continuation of Ser. No. 482,231, June 24, 1974. This application May 3, 1976, Ser. No. 682,382
Int. Cl.[2] G08B *23/00*; H04Q *9/00*
U.S. Cl. 340—408 **12 Claims**



1. A system for monitoring a protected premises from a central station including apparatus for location at the protected premises and apparatus for location at the central station and for interconnection by electrical lines, the central apparatus comprising generating means for generating first pulses at random time intervals, first transmitter means responsive to said first pulses for generating first tones having a first fre-

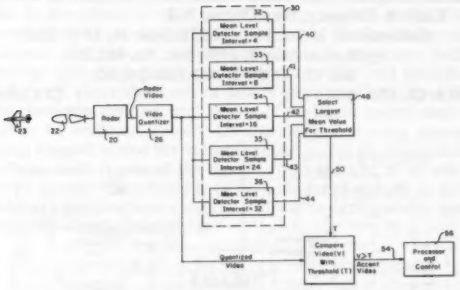
quency at sequential intervals substantially contemporaneous with those of said first pulses and of substantially like durations and for transmitting said first tones over the lines to the premises apparatus; the premises apparatus comprising premises logic means, first receiver means for receiving said first tones and providing second pulses to said premises logic means at sequential intervals substantially contemporaneous with those of said first pulses and of substantially like durations, second transmitter means operatively connected to said first receiver means through said premises logic means and responsive to said second pulses for generating second tones having a second frequency different from that of said first tones but at sequential intervals substantially contemporaneous with those of said first pulses and of like durations and for transmitting said second tones over the lines to the central apparatus substantially simultaneously with the transmission thereover of said first tones; the central apparatus further comprising second receiver means for receiving said second tones and providing third pulses at sequential intervals substantially contemporaenous with those of said first pulses and of substantially like durations, central logic means operatively connected to said generating means and said second receiver means for ascertaining the presence or not of both said first and said third pulses at the central apparatus at substantially contemporaneous times; the premises apparatus still further comprising a first alarm circuit responsive to an alarm condition at the protected premises, the first alarm circuit including said premises logic means and third transmitter means for generating a third tone having a third frequency different from those of said first and second tones, said premises logic means operatively disconnecting said first receiving means from said second transmitting means and activating said third transmitter in the event of said condition, said third transmitter means transmitting said third tone over the lines to the central apparatus substantially simultaneously with the transmission thereover of said first tones to the premises apparatus; the central apparatus still further comprising a second alarm circuit including third receiver means for receiving said third tone.

4,044,352

SIGNAL PROCESSOR

Richard D. Wilmot, Buena Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 23, 1974, Ser. No. 535,869
Int. Cl.[2] G01S 9/02
U.S. Cl. 343—5 VQ **8 Claims**


Radar
Video Quantizer
Mean Level Detector Sample Interval = 4
Mean Level Detector Sample Interval = 8
Mean Level Detector Sample Interval = 16
Mean Level Detector Sample Interval = 24
Mean Level Detector Sample Interval = 32
Select Largest Mean Value For Threshold
Compare Video(V) With Threshold (T)
Processor and Control
Quantized Video

1. A clutter processor for providing a signal threshold and responding to a source of video signals, the source receiving the video signals over a range distance comprising:

an early and late plurality of detecting means coupled to said source of video signals, each early and late detecting means sampling over a range interval of a different time interval from the other range intervals of the corresponding early and late detecting means to form a plurality of sample intervals, each plurality being respectively before and after the time of occurrence of a video signal, each detecting means determining a signal related to the clutter amplitude, and

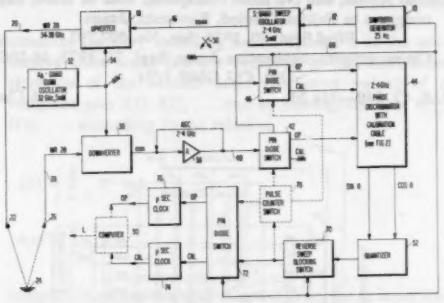
signal selection means coupled to said early and late plurality of detecting means for selecting as a function of amplitude one of the signals from said early or late detecting means related to the clutter amplitude as a threshold so as to substantially match the corresponding sample interval to the range interval of clutter.

4,044,353

MICROWAVE LEVEL GAGING SYSTEM

Ralph Levy, Newton, Mass., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Aug. 6, 1976, Ser. No. 712,168
Int. Cl.[2] G01S 9/38
U.S. Cl. 343—12 R **21 Claims**



11. A liquid level measuring method, which comprises the steps of:

generating a broad-band, swept-frequency, continuous wave, microwave signal;

transmitting said microwave signal in a narrow beam onto a liquid surface being measured;

receiving a portion of said microwave signal reflected from said liquid surface;

comparing said reflected signal with a portion of said generated signal during a first predetermined interval while said generated signal is being swept across the frequency band in a measuring direction, and generating a first phase angle signal proportional to the phase angle between said generated and said reflected signal;

quantizing said first phase angle signal to produce a standard pulse output at each of a plurality of equally spaced predetermined phase angles, said pulses comprising a first pulse train proportional to the change in said phase angle during said first predetermined interval;

transmitting at least a portion of said generated microwave signal through a calibration conductor having a length equivalent to a known free-space path length L_c;

comparing said signal passed through said calibration conductor with a portion of said generated microwave signal during a second predetermined interval that is equal and adjacent to said first predetermined interval while said generated microwave signal is being swept across the frequency band in said measuring direction, and generating a second phase angle signal proportional to the phase angle between said generated microwave signal and said signal from said calibration conductor;

quantizing said second phase angle signal to produce said standard pulse outputs at each of said plurality of equally spaced phase angles, said pulses comprising a second pulse train proportional to the change in phase angle during said second predetermined interval;

comparing said first and second pulse trains; and calculating the path length L of the reflected signal, corresponding to a particular level of the liquid, from said comparison of the first and second pulse trains, and the known freespace path length L_c of said calibration conductor.

4,044,354

DISTANCE MEASUREMENT USING MICROWAVES

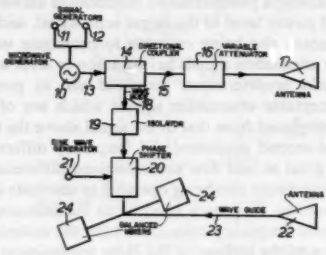
David Robert Bosher, Hayes, and John Folkard, Waltham Cross, both of England, assignors to British Steel Corporation, London, England

Filed Mar. 6, 1973, Ser. No. 338,619

Claims priority, application United Kingdom, Mar. 15, 1972, 12115/72

Int. Cl.[2] G01S 9/28

U.S. Cl. 343—14 10 Claims



1. A method for determining the distance from an object including, generating a micro-wave frequency carrier wave, simultaneously modulating the carrier wave at two different frequencies to provide a modulated signal, directing a first portion of the modulated signal towards the object and receiving a reflected signal from the object directing a second portion of the modulated signal to form a reference signal non-linearly, cyclically varying the phase of one portion of the modulated signal, mixing the reflected signal with the reference signal, and detecting the difference frequency between the reflected signal and the reference signal, said difference frequency being proportional to the distance to be determined.

4,044,355

MEASUREMENT OF CONTENTS OF TANKS ETC. WITH MICROWAVE RADIATIONS

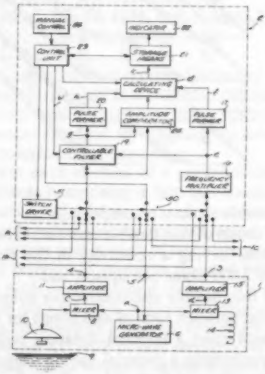
Kurt Olov Edvardsson, Linkoping, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

Continuation-in-part of Ser. No. 524,143, Nov. 15, 1974, abandoned. This application Feb. 13, 1976, Ser. No. 658,075

Claims priority, application Sweden, Nov. 20, 1973, 7315649

Int. Cl.[2] G01S 9/24

U.S. Cl. 343—14 8 Claims



8. A method of measuring distance to a target surface by generating a microwave signal that varies in frequency substantially regularly through a predetermined time period, radiating a first part of said generated signal towards the target surface to produce a return signal reflected from the target surface, and mixing said return signal with a second part of the generated signal to obtain an oscillatory output having a difference frequency which is a function of the distance to be measured, said method being characterized by steps which enable a final output to be obtained that accurately denotes the distance travelled by the return signal notwithstanding any irregularities in said oscillatory output that are due to disturbances in the return signal and lack of perfect regularity in the frequency variation of the generated microwave signal, said steps comprising:

A. producing a second oscillatory output having a reference frequency which is substantially higher than that of the first oscillatory output by

1. mixing a third part of said generated signal with a fourth part thereof that has been subjected to a predetermined delay and

2. multiplying by a fixed constant value the difference frequency signal obtained as a result of the last mentioned mixing;

B. producing

1. a first pulsing output that provides a pulse for every half-cycle of said first oscillatory output, and

2. a second pulsing output that provides a pulse for every half cycle of said second oscillatory output;

C. assigning a numerical weighting factor to each of the successive short time intervals that begins with the issuance of each pulse of said first pulsing output during a major portion of said time period, which weighting factor is equal to $n(N-n)$, where

N denotes the number of said time intervals in said portion of said time period, and

n denotes the ordinal number of the particular time interval in said time period;

D. multiplying each pulse of the first pulsing output issued during said portion of said time period by the value of $n(N-n)$ for the time interval in which such pulse is issued;

E. storing the products of all such multiplications during the time period to obtain a first weighted pulse count;

F. multiplying each pulse of said second pulsing output by the value of $n(N-n)$ for the time interval in which that pulse is issued;

G. storing the products of all of the last mentioned multiplications during said time period to obtain a second weighted pulse count; and

H. at the conclusion of said time period producing an output which corresponds to a quotient relationship between said first and second weighted pulse counts and which consitutees said final output.

4,044,356

PROCESS AND DEVICE FOR CORRELATION FOR USE IN A DOPPLER RADAR INSTALLATION

Jacques Fournier, Chatillon sur Bagneux, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Sept. 22, 1975, Ser. No. 615,686

Claims priority, application France, Sept. 27, 1974, 74.33248

Int. Cl.[2] G01S 9/02, 7/28

U.S. Cl. 343—17.2 R 3 Claims

1. A doppler radar device for target measurements comprising the combination of:

a pseudo-random digital pulse generator delivering a series of pulses alternatively representative of 1 and 0 binary states;

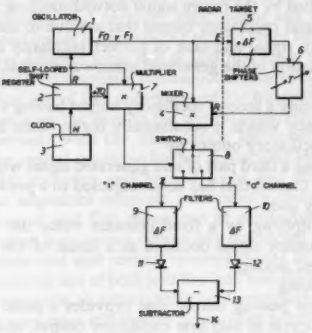
an oscillator under the control of said pulse generator to alternatively deliver signals at two different frequencies for radar transmission purposes;

a first multiplier having two inputs to which are applied respectively said series of pulses and a delayed version

thereof imparted with a predetermined delay corresponding to the distance zone to be surveyed by radar, and an output;

a second multiplier having two inputs to which are applied respectively said radar transmission signals and radar receiver echo signals, and an output;

a switch connected to said second multiplier output and monitored by said first multiplier output;



a 1 channel and a 0 channel each comprising a filter, under the control of said switch to be alternatively connected therethrough to said second multiplier output, depending on the monitoring of said switch by said first multiplier output; and

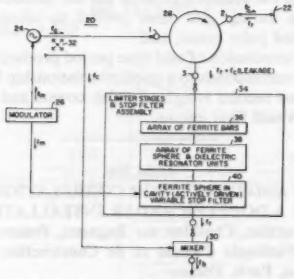
means for extracting from said channels an operational radar signal.

4,044,357

FM/CW RADAR INCLUDING A NOVEL RECEIVER PROTECTOR OF GENERAL UTILITY

Harry Goldie, Randallstown, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 4, 1975, Ser. No. 637,493
Int. Cl.[2] G01S 9/24
U.S. Cl. 343—17.5 **16 Claims**


MODULATOR
LIMITER STAGES & STOP FILTER ASSEMBLY
ARRAY OF FERRITE BARS
ARRAY OF FERRITE SPHERE & DIELECTRIC RESONATOR UNITS
FERRITE SPHERE IN CAVITY (ACTIVELY DRIVEN) VARIABLE STOP FILTER
MIXER

1. A radar system utilizing a single duplexing antenna arrangement, said system comprising:

means for continously generating a transmission signal;

an antenna that is operative to radiate the output of the generating means and to receive a target echo signal;

means for coupling the output of said generating means to said antenna, said coupling means further having a target echo signal output port and being operative to couple said target echo signal from the antenna to said target echo signal output port, said coupling means having leakage of a component of the output of said generating means to said target echo signal output port;

means for modulating the generating means to produce at the output of the generating means a transmission signal having a frequency which varies in a predetermined manner relative to time to cause a first predetermined difference between the instantaneous frequencies of the transmission signal and target echo signals appearing at said target echo signal output of said coupling means;

means for attenuating signals at the target echo signal output port of the coupling means, said attenuating means being operable to attenuate a signal having a frequency within a known range of frequencies and having a power level which exceeds a predetermined threshold in excess of the expected power level of the target echo signal, said attenuating means also being operable to propagate with acceptable attenuation signals having a power level which is below said predetermined threshold and to propagate with acceptable attenuation signals which are of a frequency displaced from that of the signal above the threshold by a second predetermined frequency difference at least as great as said first predetermined difference, said attenuating means also being operable to attenuate a signal over a narrow frequency band at an instantaneous stop band center frequency coincident with the instantaneous frequency of the leakage of the radar transmission signal; and

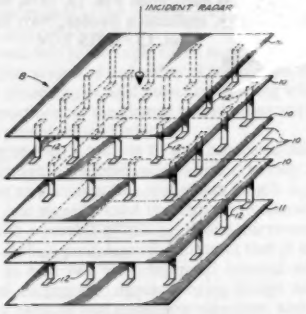
means for heterodyning a portion of the transmission signal and the signal at the output port of said attenuating means to produce a beat frequency signal.

4,044,358

SELF ERECTABLE STRUCTURE

William P. Manning, and Louis Maus, both of Tulsa, Okla., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 25, 1967, Ser. No. 670,828
Int. Cl.[2] H01Q 15/00, 17/00
U.S. Cl. 343—18 A **14 Claims**



2. A self-erectable structure comprising:

a plurality of sheets of thin flexible material, at least a portion of said sheets having a resistivity in the range of from about 40 to 2,000 ohms per square; and

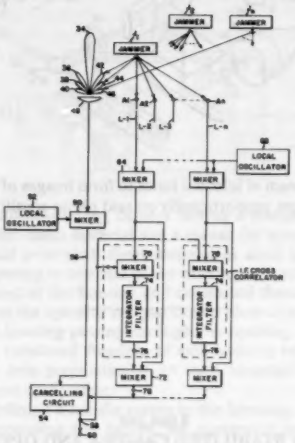
a plurality of thin flexible non-conductive connecting members attached between each of said sheets for spacing each of said sheets apart a selected distance, said connecting members comprising a material having shape memory so that said members deform when the structure is compressed and spontaneously return to their original shape when released.

4,044,359

MULTIPLE INTERMEDIATE FREQUENCY SIDE-LOBE CANCELLER

Sidney P. Applebaum, Liverpool; Paul W. Howells, Morrisville, and James C. Kovarik, North Syracuse, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Jan. 9, 1962, Ser. No. 165,259
Int. Cl.[2] H04B *1/10*; G01S *3/06*
U.S. Cl. 343—100 LE 8 Claims



1. In an undesired canceller, a main signal transmission channel having an output terminal, a plurality of auxiliary signal transmission channels having output terminals, means for cross coupling each of said auxiliary channels separately to said main signal transmission channel, means for generating error signals representing the relative amplitude and phase of each undersired signal in the auxiliary channels cross-coupled with undesired signals in the main channel, compensating cross feed networks capable of adjustment for minimizing cross coupling at said main channel output terminal, and means responsive to said error signals for adjusting said cross feed networks in order to minimize cross coupling.

4,044,360

TWO-MODE RF PHASE SHIFTER PARTICULARLY FOR PHASE SCANNER ARRAY

Ronald I. Wolfson, Northridge, and Bobby J. Sanders, Pacoima, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

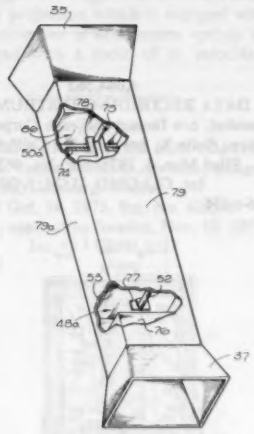
Filed Dec. 19, 1975, Ser. No. 642,297
Int. Cl.[2] H01Q *19/00*
U.S. Cl. 343—754 12 Claims

1. In a scanning antenna system including a plurality of antenna elements arranged in a two-dimensional array having first and second back-to-back apertures surfaces and having space feed means arranged for illuminating said first aperture surface, the combination comprising:

means within each element of a predetermined fraction of said elements comprising a first RF window within said first aperture of said array and a second RF window within said second aperture of said array;

phase shift means within each of said elements of said predetermined fraction of elements coupled betwen said windows of each corresponding element, for controlling the RF phase through each element in response to a corresponding condition of a discrete externally supplied phase control signal for each of said elements so controlled;

and switching means within at least a second fraction of said predetermined fraction of said elements for selectively permitting passage of RF energy from said space feed through said first window, said phase shift means and said second RF window in a first switching condition, and bidirectionally through said first window and said phase shift means in a second switching condition, said switching means providing a reflection point within said antenna element in said second switching condition.

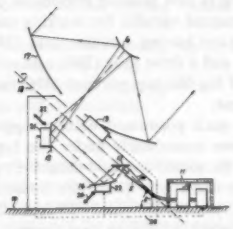


4,044,361

SATELLITE TRACKING CASSEGRAINIAN ANTENNA

Hiroshi Yokoi, Machida, and Masataka Akagawa, Yokohama, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Apr. 29, 1976, Ser. No. 681,450
Claims priority, application Japan, May 8, 1975, 50-54240
Int. Cl.[2] H01Q *19/18, 3/12*
U.S. Cl. 343—754 9 Claims



1. An antenna apparatus comprising:

a primary radiator having an auxiliary symmetric field pattern;

a subreflector coupled to said primary radiator through a beam wave-guide path;

a main reflector coupled to said subreflector through a beam wave-guide path;

movable wave-guide means provided in said beam wave-guide path between said primary radiator and said subreflector;

rotation means coupled to said primary radiator, said subreflector, said main reflector and said movable beam wave-guide means for rotating, within a small angular range, said primary radiator, said subreflector, said main reflector and said movable beam wave-guide means as one body about an antenna rotating axis aligned with the axis of the primary radiator but a little deviated from the polar axis of the earth; and

drive means coupled to said movable beam wave-guide

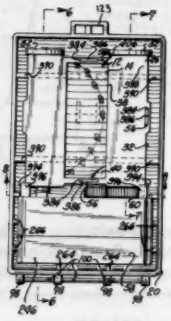
means for controlling said movable beam wave-guide means to deflect an antenna beam radiated from said main reflector.

4,044,362

DATA RECORDING INSTRUMENT

Bart E. Greenhut, c/o Impact-O-Graph Corporation, 4943 McConnell Ave., Suite K, Los Angeles, Calif. 90066

Filed Mar. 4, 1976, Ser. No. 663,701
Int. Cl.[2] G01D *15/24, 9/00*
U.S. Cl. 346—136 **2 Claims**



1. A recording instrument for accompanying a cargo, to record an environmental variable that can affect the cargo, comprising:

a housing;

a chart pack in said housing, said chart pack including a chart case containing a supply reel, a takeup reel, and a strip chart extending between the reels, and including a driven gear **(286)** connected to the takeup reel;

means lying in said housing responsive to a predetermined environmental variable for marking said chart; and

a drive motor having a motor case **(246)** located in said housing and a drive gear **(284)**, said motor case including a pair of lug-like top portions **(396)** on either side of the drive gear;

said chart pack positioned with an upper part **(34)** of the chart case immediately under the lug-like top portions **(396)** of the motor case and the driven gear **(286)** engaged with the drive gear **(284)**, the housing having pack retainer portions **(398)** which old down the side of the chart pack adjacent the driven gear thereof, whereby the gears are accurately meshed and yet when the housing is opened the chart pack can be easily removed.

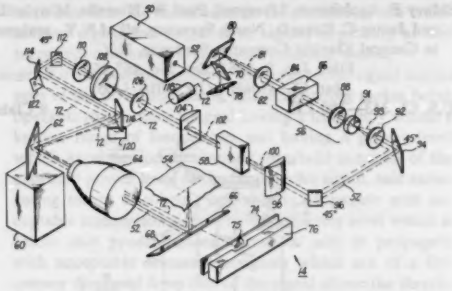
4,044,363

LASER PHOTOCOMPOSITION SYSTEM AND METHOD

Grant T. Morgan, Delray Beach, Fla., assignor to Dymo Industries, Inc., San Francisco, Calif.

Continuation of Ser. No. 535,842, Dec. 23, 1974, abandoned.
This application Feb. 13, 1975, Ser. No. 549,844
Int. Cl.[2] G06K *15/12;* **B41B** *0/00*
U.S. Cl. 354—5 **30 Claims**

1. A photocomposing device comprising, in combination, a laser source for producing a laser beam, first deflection means for moving said beam in a first direction lengthwise of a line of characters to be composed, second deflection means for moving said beam rapidly back and forth in a second direction which is transverse to said first direction, projection means for projecting said beam onto a photo-sensitive surface, and blanking means for substantially completely blocking the transmission of said beam at selected times to form images of characters and space them proportionally on said photo-sensitive surface.

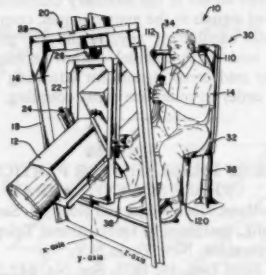


4,044,364

GRAVITY STABILIZED CAMERA AND OPERATOR MOUNT

Joseph Prinzo, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed July 2, 1976, Ser. No. 702,245
Int. Cl.[2] G03B *39/00*
U.S. Cl. 354—74 **14 Claims**



1. An assembly for installation in a window opening of an airborne vehicle providing gravity stabilization of a camera and its operator against changes in vehicle attitude comprising a combination:

A. a tilt frame mounting a camera thereon;

B. a main frame;

C. pin means pivotably mounting the tilt frame in the swing frame;

D. a universal assembly hang-mounting the main swing frame in the vehicle window opening to provide rotational motion and front-to-back and side-to-side rocking motion to the swing frame;

E. an operator mounting assembly exhibiting front-to-back and side-to-side rocking motion when occupied;

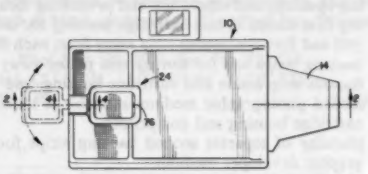
F. means mounting the operator assembly in the vehicle; and

G. means interconnecting the main swing frame and the operator assembly such that both move as an intergral unit irrespective of the motions of the vehicle.

4,044,365
HANDLE CONSTRUCTION FOR SELF-DEVELOPING CAMERAS

Donato F. Pizzuti, Saugus, and James K. Skurski, Beverly, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sept. 2, 1976, Ser. No. 719,841
Int. Cl.[2] G03B *17/50*
U.S. Cl. 354—85 26 Claims



1. In a self-developing camera having a housing to receive photographic sheet material and a means for spreading a processing fluid over such sheet material as same is withdrawn from an opening at one end of the housing, a handle located at the other end of the housing and connected thereto at a point spaced from the opening and positioned close to a longitudinal axis of the housing passing through the opening, such handle permitting rotational freedom of said housing relative to the handle on axis perpendicular to such longitudinal axis the improvement comprising:

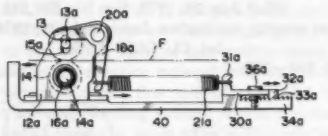
means defining a handle recess in the housing; and

means mounting the handle for movement to a recessed position within said handle recess.

4,044,366
DEVICE FOR APPLYING PRESSURE TO DEVELOPER DISTRIBUTING MEANS IN SELF-DEVELOPMENT TYPE CAMERAS

Toshio Goto, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Oct. 29, 1974, Ser. No. 519,029
Claims priority, application Japan, Nov. 6, 1973, 48-124812
Int. Cl.[2] G03B *17/50*; G03D *9/02*
U.S. Cl. 354—86 7 Claims

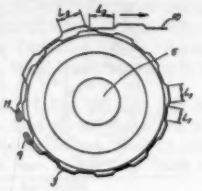


1. In a photographic camera including a pair of pressure-applying members having opposite ends and forming a nip between which a film unit including a photosensitive sheet is fed to spread a developer thereon, a pressure-applying device for urging one of said pressure-applying members towards the other comprising, in combination a pair of bell crank levers pivotally mounted in said camera respectively adjacent said opposite ends of said pressure-applying members for swinging movement about an axis extending parallel to said nip, one arm of each of said bell crank levers being engaged respectively with said opposite ends of one of said pressure-applying members, a pair of tension springs each of which is engaged in tension with the other arm of a respective one of said bell crank levers for urging the bell crank levers in the direction to press said one of said pressure-applying members toward the other pressure-applying member, spring-force control means for controlling the force of the springs exerted on the bell crank levers by controlling the tension of said tension springs, said spring-force control means comprising a pair of tension control members mounted in said camera and respectively engaged with one end of said pair of tension springs each of said tension control members including a fixed toothed member having a row of teeth arranged in a lengthwise direction and a movable member having a projection which is engaged with said one end of the respective one of said tension springs and a hook selectively engaged with a tooth of its associated toothed member.

4,044,367
ROLLER BLIND SHUTTER FOR CAMERAS

Lennart Dahlgren, Vastra Frolunda, Sweden, assignor to Fritz Victor Hasselblad, Goteburg, Sweden

Filed Oct. 14, 1975, Ser. No. 621,847
Claims priority, application Sweden, Nov. 15, 1974, 7414378
Int. Cl.[2] G03B *9/32*
U.S. Cl. 354—242 5 Claims



1. A shutter for cameras including,

a. an opening curtain and

b. a closing curtain,

c. a transverse slit formed between said curtains,

d. drive means for traversing said curtains and said transverse slit formed therebetween longitudinally of said curtains from a first position to a second position, said drive means including,

e. axle means for receiving said closing curtain wound thereon and for receiving a portion of said opening curtain wound at least partially thereon in overlapped relationship with a portion of said closing curtain in said first position,

f. said opening curtain and said closing curtain having transverse depressions therein,

g. said transverse depressions forming

h. planar plateaus and intermediate,

i. planar valleys separated by

j. transition areas,

k. the longitudinal length of the plateaus of one of said curtains being substantially greater than the longitudinal length of the planar valleys of the other of said curtains in the region of overlap of the curtains in said first position.

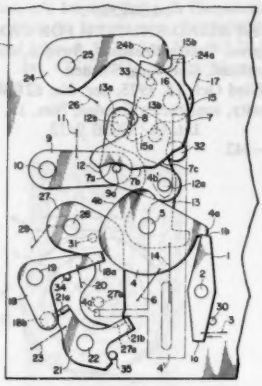
4,044,368
HIGH SPEED EXPOSURE TIME CONTROL MEANS FOR FOCAL PLANE SHUTTERS

Nobuyoshi Inoue, Kawagoe, Japan, assignor to Copal Company Limited, Japan

Filed Apr. 19, 1976, Ser. No. 678,437
Claims priority, application Japan, Apr. 21, 1975, 50-47489
Int. Cl.[2] G03B *17/38*
U.S. Cl. 354—267 3 Claims

1. A high speed exposure time control means for focal plane shutters comprising a base plate, a high speed exposure time controlling member mounted on said base plate so as to be able to move between its cocked position and uncocked position, a high speed switching lever supported rotatably on said base plate and supporting rotatably thereon a high speed operating lever engageable with said high speed exposure time controlling member, a front blade operating lever supported rotatably on said base plate and pin-slot connected with said high speed operating lever, a speed changing cam engageable with said

high speed operating lever to change relative positions of said high speed exposure time controlling member and high speed operating lever, and a rear blade operating lever supported rotatably on said base plate and engageable with said high speed exposure time controlling member, said high speed operating lever being so arranged with respect to said high speed exposure time controlling member that engaging time of said high speed operating lever and high speed exposure time con-



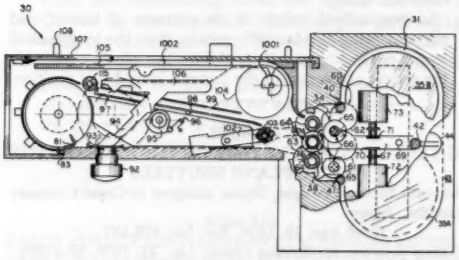
trolling member may vary in response to set position of said speed changing cam, and said rear blade operating lever being so arranged with respect to said high speed exposure time controlling member that engagement of said rear blade operating lever and high speed exposure time controlling member with each other may take place when a fixed time has elapsed after starting of said high speed exposure time controlling member.

4,044,369

PHOTOGRAPHIC FILM ASSEMBLY AND MAGAZINE THEREFOR

Ashok B. Nayak, Tustin, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 14, 1975, Ser. No. 540,765
Int. Cl.[2] G03B *17/26*
U.S. Cl. 354—275 **14 Claims**



1. A cartridge-type photographic medium comprising in combination:

a cartridge housing having first and second openings for discharging photographic media;

a first photographic medium assemblage located in said cartridge housing and comprising:

a plurality of separate first elongate backing strips for photographic film;

a plurality of separate strips of said photographic film located on said first backing strips; and

means for interconnecting said first backing strips and covering said photographic film strips, comprising a first single continuous strip extending over at least the entire length of each photographic film strip and being attached to each of said first backing strips at least at two spaced portions of each first backing strip located, respectively, adjacent opposite ends of said length; and

means for successively separating said first single continuous strip from said first backing strips and photographic film strips and for propelling said separated first back strips and photographic film strips through said first cartridge housing opening, said separating and propelling means including first means in said cartridge housing for successively pull and first continuous strip away from each of said first backing strips and for storing said pulled-away first continuous strip inside said cartridge housing; and

a second photographic medium assemblage located in said cartridge housing and comprising:

a plurality of separate second backing strips for a photographic developer medium;

a plurality of separate strips containing said photographic developer medium; and

means for interconnecting said second backing strips and covering said developer medium strips, comprising a second continuous strip extending over at least one entire dimension of each developer medium strip and being attached to each of said second backing strips at least at portions of each second backing strip located adjacent opposite ends of said dimension; and

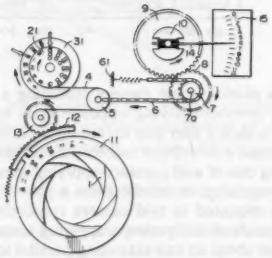
means for successively separating said second continuous strip from said second backing strips and photographic developer medium strips and for propelling said separated second backing strips and said photographic developer medium strips through said second cartridge housing opening, said separating and propelling means including second means in said cartridge housing for successively pulling said second continuous strip away from each of said second backing strips and for storing said pulled-away second continuous strip inside said cartridge housing.

4,044,370

PHOTOGRAPHIC CAMERA WITH DENSITY-VARIABLE FILTER

Toshihiro Kondo, Chofu, Tokyo, Japan, assignor to Toshihiro Kondo, Chofu and Fuji Photo Film Co., Ltd., both of Japan

Filed July 28, 1975, Ser. No. 599,342
Claims priority, application Japan, July 29, 1974, 49-86714
Int. Cl.[2] G03B *17/00*
U.S. Cl. 354—289 **7 Claims**



1. A photographic camera comprising a diaphragm the aperture size of which is freely selectable by manual operation, a shutter means the shutter speed of which is freely selectable by manual operation, and a density-variable optical filter means the density of which is freely selectable by manual operation independently of said diaphragm and shutter means, said filter means comprising a manual control member which is manually operated to vary the density of the filter, and an optical filter the density of which is varied by operation of said

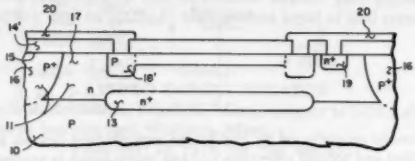
manual control member, said manual control member being graduated with a scale which indicates the density of the filter and an exposure meter which indicates the scene brightness in the same unit system as that of said scale graduated on the manual control member.

4,044,371

PLURALITY OF PRECISE TEMPERATURE RESISTORS FORMED IN MONOLITHIC INTEGRATED CIRCUITS

Mona M. Abdelrahman, Minnetonka, and James M. Daughton, Edina, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 29, 1976, Ser. No. 727,736
Int. Cl.² H01L *23/56, 29/66, 27/02, 27/04*
U.S. Cl. 357—28 **6 Claims**



1. A monolithic integrated circuit sensistor provided in a semiconductor material of a selected total resistance having a selected temperature coefficient of resistance and having a voltage coefficient of resistance which is less than a selected value, said sensistor comprising:

a set of n isolated regions in said semiconductor material, each of a first conductivity type;

a set of n resistor regions, each of a second conductivity type which is determined by ions implanted therein in a selected dose to provide said temperature coefficient of resistance, each of said resistor regions being located in a corresponding one of said isolated regions with a semiconductor junction occurring between each said resistor region and its corresponding isolated region and each of said resistor regions having a first end and a second end; and

an interconnection network means electrically connecting each of said resistor regions in series with one another at said first and second ends in a resistor string and further adapted to electrically connect said resistor string into a circuit, said interconnection network means directly electrically connecting said first end of each said resistor region to its corresponding isolated region, a value for n being selected of two or more to be sufficiently large to reduce said voltage coefficient of resistance to being less than said selected value.

4,044,372

PHOTOVOLTAIC CELL HAVING CONTROLLABLE SPECTRAL RESPONSE

Harold Weinstein, Sherman Oaks, Calif., assignor to Sensor Technology, Inc., Chatsworth, Calif.

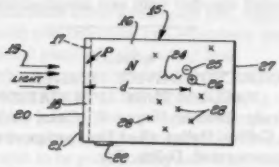
Filed Aug. 5, 1974, Ser. No. 494,764
Int. Cl.² H01L *27/14*
U.S. Cl. 357—30 **6 Claims**

1. A photovoltaic cell having preselected spectral response, comprising;

a semiconductor body,

a shallow junction in said body adjacent the front face thereof, and

means modifying the minority carrier transport properties of said body to decrease the percentage of minority carriers, produced by absorption of photons of relatively long wavelength within said body, that reach said junction, so that the peak spectral response of said cell is shifted toward shorter wavelengths, said modifying means comprising recombination centers for said minority carriers in said body.

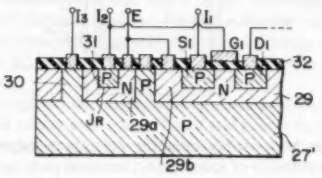


4,044,373

IGFET WITH GATE PROTECTION DIODE AND ANTIPARASITIC ISOLATION MEANS

Kosei Nomiya, Tokyo; Toshihiko Kohisa, Sayama, and Isao Matsumura, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Division of Ser. No. 768,794, Oct. 18, 1968, Pat. No. 3,934,159. This application June 12, 1973, Ser. No. 369,131
Claims priority, application Japan, Nov. 13, 1967, 42-72628; Nov. 13, 1967, 42-72629; Nov. 13, 1967, 42-72630; Nov. 15, 1967, 42-73055; Nov. 15, 1967, 42-73056
Int. Cl.² H01L *29/78, 27/04, 27/12, 29/90*
U.S. Cl. 357—41 **7 Claims**



1. In a semiconductor device comprising:

an insulated gate type field effect element including a semiconductor substrate of first conductivity type, a pair of source and drain regions of second conductivity type opposite to said first conductivity type formed in a surface of said semiconductor substrate, an insulated gate electrode disposed on said surface between said source and drain regions, and an insulating film interposed between said insulated gate electrode and said semiconductor substrate;

a protecting diode means formed unitarily with said field effect element and connected in parallel between said insulated gate electrode and said semiconductor substrate for preventing the insulating film below said gate electrode from breakdown, said protecting diode means including a semiconductor region and an electrode means with a rectifying barrier disposed therebetween, said rectifying barrier having a backward breakdown voltage lower than the breakdown voltage of the insulating film below said gate electrode; the improvement comprising

isolation means for electrically isolating said semiconductor region of said protecting diode means from said semiconductor substrate in which said field effect element is formed; and wherein

the conductivity type of said semiconductor region of said protecting diode means is said first conductivity type, and said isolation means includes a semiconductor layer of said second conductivity type interposed between said semiconductor region of said protecting diode means and said semiconductor substrate; and wherein

said semiconductor layer is biased in the backward polarity

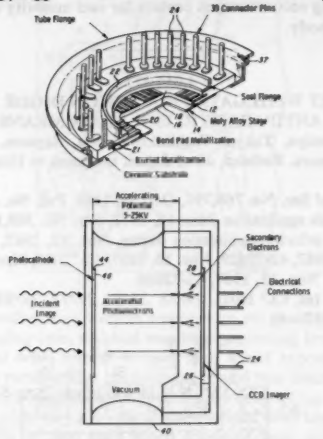
to said semiconductor region of said protecting diode means and said semiconductor substrate; and wherein the semiconductor region of said protecting diode means is connected together with said semiconductor substrate.

4,044,374

SEMICONDUCTOR DEVICE HEADER SUITABLE FOR VACUUM TUBE APPLICATIONS

Charles Grady Roberts; Wayne W. Chan, both of Plano, and Dean R. Collins, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 19, 1976, Ser. No. 650,396
Int. Cl.[2] H01L *39/02, 29/78;* G01T *1/24;* H01L *23/02*
U.S. Cl. 357—80 **22 Claims**



1. A header assembly including a charge transfer device chip having a plurality of spaced apart terminal pads on one surface thereof, an insulating support; a mounting surface unitary with said support; a plurality of conductive leads affixed to said support member and extending generally outwardly from said mounting surface; means fixedly mounting said charge transfer device chip on said mounting surface; respective electrical interconnections between said terminal pads and said conductor leads; and cover means surrounding said chip in vacuum-tight sealed relation with said insulating support to enclose said electrical interconnection; said conductive leads extending beyond said cover means; means hermetically sealing said conductive leads along the lengths thereof between the interior and exterior of said cover means; and terminal leads electrically connected with said conductive leads externally of said cover means.

4,044,375

BRIGHTNESS CONTROL APPARATUS

Marvin Neil Norman, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 19, 1976, Ser. No. 715,851
Int. Cl.[2] H04N *9/535, 5/58, 5/18*
U.S. Cl. 358—40 **13 Claims**

1. In a color television system including means for amplifying color representative signals, means for amplifying luminance signals having periodic blanking intervals and image intervals containing image brightness information disposed between adjacent ones of said blanking intervals, and a color image reproducing device, apparatus comprising:

means fo providing periodic keying signals during said banking intervals;

first means for coupling said color representative signals to said color signal amplifying means;

first clamping means coupled to said keying means and to said first coupling means and responsive to said keying signals for clamping said color representative signals to a first reference voltage level;

second means for coupling said luminance signals to said luminance signal amplifying means;

second clamping means coupled to said keying means and to said second coupling means for clamping said blanking interval portions of said luminance signals to a second reference voltage level representative of a black tone of an

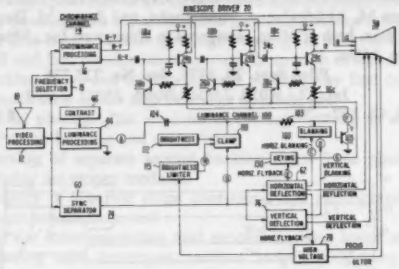


image reproduced by said image reproducing device, said first and second reference voltage levels being in predetermined relation and dependent upon said keying signals; and

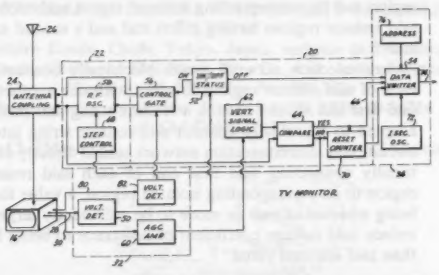
image brightness controlling means coupled to said second clamping means for varying said second reference voltage level and therefore said black tone reference level and brightness of a reproduced image.

4,044,376

TV MONITOR

James L. Porter, San Diego, Calif., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Aug. 13, 1976, Ser. No. 714,431
Int. Cl.[2] H04N *7/02*
U.S. Cl. 358—84 **15 Claims**



14. In a television monitor for monitoring the reception status of a television receiver, said receiver being capable of detecting selected ones of a plurality of wave signals, each representing a separate video channel, said receiver including an antenna for receiving said wave signals, a horizontal retrace circuit, a vertical retrace circuit and a kinescope circuit, and said monitor including a first probe connected to said horizontal retrace circuit for detecting a voltage in said horizontal retrace circuit, a second probe connected to said kinescope circuit for detecting a signal frequency in said kinescope circuit, first logic means connected to said first probe for determining whether said receiver is in an "on" or "off" condition, a signal oscillator for generating a radio frequency signal within the bandwidth of a channel which said receiver is capable of receiving, an antenna coupler for selectively coupling said receiver to said antenna or to said oscillator so that the antenna input of said receiver selectively receives wave signals from said antenna or a radio frequency signal from said oscilla-

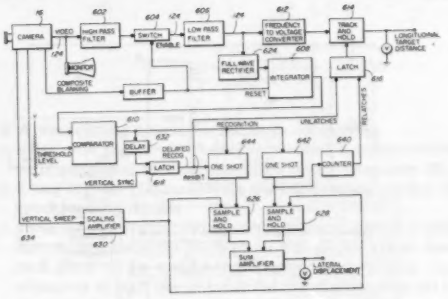
tor, and a comparator connected to said oscillator and to said second probe for comparing the frequency of signals in said kinescope circuit with the radio frequency signal generated by said oscillator and for providing an indication of the correspondance or non-correspondance of such signals, said oscillator being responcive to an indication of non-coincidence of such signals from said comparator to generate another radio frequency signal within the bandwidth of a channel which said receiver is capable of receiving different from said first-named channel, the inprovement comprising: third probe means connected to said vertical retrace circuit for detecting a predetermined voltage level in said vertical retrace circuit; second logic means coupled to said third probe means and responcive to the voltage level detected thereby for providing a gate signal when the voltage level detected by said third probe means is representative of the beginning of a vertical sweep in said receiver, said antenna coupler being connected to said second logic means and responcive to said gate signal for coupling said oscillator to said antenna input of said receiver.

4,044,377

VIDEO TARGET LOCATOR

Edwin R. Bowerman, Topsfield, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 28, 1976, Ser. No. 680,832
Int. Cl.[2] H04N *7/18*; G01C *3/08, 3/32*
U.S. Cl. 358—107 **14 Claims**



11. A method for locating a targeted object with respect to a station point comprising the steps of:

mounting a video camera at the station point;

placing a target pattern of successive spaced-apart markings in a fixed spactial relationship with the targeted object;

bringing the target pattern within the viewing field of the camera to cause the camera to generate a series of pulses during its scan of the pattern, and

generating a first distance signal related to the pulse frequency.

4,044,378

OPTICAL SYSTEM FOR REFLECTIVE MODE VIDEO PLAYBACK APPARATUS

Leonard J. Laub, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Nov. 4, 1975, Ser. No. 628,717
Int. Cl.[2] H04N *5/76*
U.S. Cl. 358—128 **1 Claim**

1. In an optical video playback device for scanning the storage track of a video record ot the type that is reflective to a reading beam derived from a source of light energy, an improved optical system for deriving an output signal which comprises:

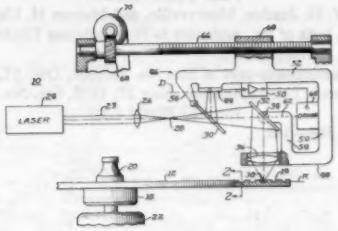
a light detector;

means for directing a reading beam along a predetermined optical path extending from said energy source to a reading plane and thence to said light detector; its back focal plane located inside said objective, positioned in said path for focusing said beam on the storage track of a record located in said reading plane and for returning energy reflected from said record track along said path to said light detector;

a mirror, displaceable about a reference axis, disposed across said path with said reference axis effectively positioned in said back focal plane of said reading lens;

an optical relay interposed between said mirror and said achromat objective for effectively positioning said mirror axis in said back focal plane of said achromat objective,

said optical relay comprising an intermediate lens for forming a light spot to be projected by said achromat objective onto said record track and for imaging said mirror axis into said back focal plane of said achromat objective,



said intermediate lens being spaced from said mirror axis by a distance equal to $f_i[(1 + f_i x)]$, where f_i is the focal length of said intermediate lens and x is the Newtonian back conjugate distance specified for said achromat objective,

and spaced from said achromat objective a distance equal to $f_i + x + f'$, where f' is the focal length of said achromat objective;

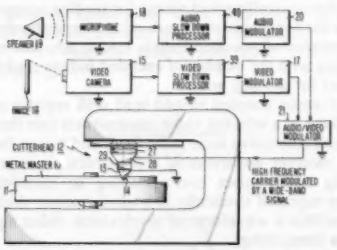
and a beam-splitter also disposed across said path and spaced from said mirror in the direction of said source for deflecting reflected energy out of said path toward said light detector.

4,044,379

METHOD AND APPARATUS FOR ELECTROMECHANICAL RECORDING OF SHORT WAVELENGTH MODULATION IN A METAL MASTER

Jerome Barth Halter, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed June 30, 1975, Ser. No. 591,968
Int. Cl.[2] H04R *17/02*; G11B *3/00*
U.S. Cl. 358—128 **13 Claims**



1. A method for recording short wavelength modulation in a master by mechanical cutting comprising:

1. placing a metal master on a support in operating relationship with an unheated cutting stylus in order to effect a relative motion between the metal master and the cutting stylus;

2. positioning the cutting stylus with respect to the metal master in order to cut a groove having a quiescent groove

depth less than one micrometer while the relative motion is established; and

3. vibrating the cutting stylus about the quiescent position thereof in response to a relatively high frequency signal while cutting the groove in order to effect short wavelength modulation of groove depth having a peak-to-peak dimension less than one micrometer;

wherein the wavelength of the groove modulation is such that a satisfactory recording is obtained when the peak-to-peak dimension of the groove modulation is less than one micrometer.

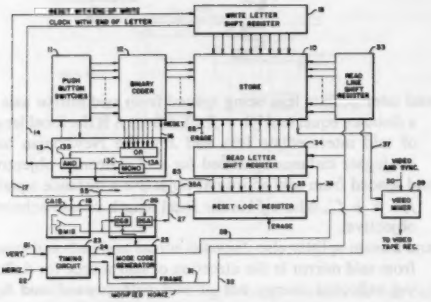
4,044,380
ENCODER AND CONSTRUCTED ANSWER SYSTEM FOR TELEVISION

James W. H. Justice, Murrysville, and Marcus H. Uhler, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 425,667, Dec. 17, 1973, abandoned. This application June 27, 1975, Ser. No. 591,212

Int. Cl.[2] H04N *7/08*

U.S. Cl. 358—142 **16 Claims**



1. In a transmitter, an apparatus to repeat cyclically the transmission of code pulses being transmitted in succession within the waveform for video signals in a television system, said apparatus comprising:

means for storing code pulses corresponding to encoded indicia;

means for loading said means for storing with preselected encoded indicia;

shift register means for indexing said means for storing to receive successive encoded indicia;

read shift register means for reading from said means for storing code pulses in succession corresponding to said preselected encoded indicia;

means for controlling said means for reading to repeat cyclically the reading of code pulses by comparing the number of preselected encoded indicia loaded into said means for storing with the number of encoded indicia read from said means for storing; and

control means coupled to said read shift register means for clocking at a selected video transmission rate the readings of each successive code pulse from said means for storing.

10. A receiver apparatus in a constructed answer system employing code pulses corresponding to encoded indicia which are repeated cyclically in a serial manner during transmission within a waveform of a television video signal, said apparatus comprising:

means for deriving a television video signal including said code pulses transmitted therewith in a cyclically repeating manner;

means for separating said code pulses transmitted in said serial manner from said video signal;

converter means receiving said code pulses in their occurring serial manner for conversion into time-collected groups of cyclically repeating code pulses corresponding to said encoded indicia;

decoder means receiving each of said groups of cyclically repeating code pulses for producing cyclically repeating decoded signals representing recovered indicia;

means for producing a plurality of signals corresponding to selected indicia to form a response answer input;

a plurality of AND gates separately receiving a cyclically repeating signal representing said recovered indicia, said gates further separately receiving a signal corresponding to said selected indicia such that the signals to each AND gate represent corresponding ones of said selected and recovered indicia;

means for delivering clocking pulses to said AND gates collectively; and

a correct pulse shift register means responsive to a pulse from said AND gates for indexing the delivery of successive clocking pulses by said means for delivering.

4,044,381
AUTOMATIC WAVEFORM EQUALIZING SYSTEM FOR TELEVISION RECEIVER

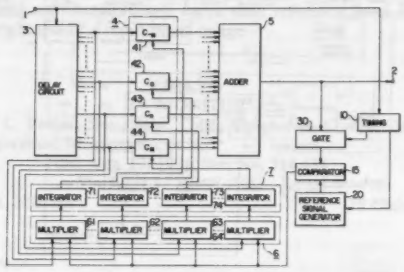
Masaru Shimano, and Iwao Aizawa, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed May 30, 1975, Ser. No. 582,076

Claims priority, application Japan, June 3, 1974, 49-62680; June 3, 1974, 49-62681; June 3, 1974, 49-62682, June 3, 1974, 49-62684

Int. Cl.[2] H04N *5/14, 5/44*

U.S. Cl. 358—160 **4 Claims**



1. An automatic waveform equalizing system for use in a television receiver for automatically compensating for linear waveform distortion occurring in a standard television signal received by the television receiver comprising a transversal filter including delay means having a plurality of taps for delivering output signals with successively increased delay times having a predetermined time interval therebetween, a plurality of control means for controlling the polarity and amplitude of the individual output signals delivered from said taps of said delay means, and adding means for adding the individual output signals controlled by said control means; means for applying the standard television signal to said transversal filter; means for extracting solely a predetermined signal portion from the television signal output of said transversal filter; reference signal generating means for generating a reference signal having the same waveform as the original transmitted waveform of said predetermined signal portion; comparing means for comparing said signal extracted by said extracting means with said reference signal generated by said reference signal generating means with the same timing thereby obtaining an error signal representing the difference therebetween; a plurality of control signal generating means including means for multiplying the individual output signals delivered from said taps of said delay means by said error signal obtained by said comparing means, and integrating means for integrating the resultant individual signals respectively; and means for controlling said control means by applying the individual control signals generated by said control signal generating means on the basis of the individual output signals of said taps

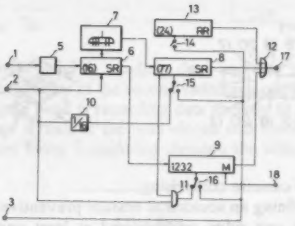
of said delay means to said control means controlling the output signals of the respective taps of said delay means; wherein said extracting means comprises means for extracting at least one serrated portion of the vertical synchronizing pulses in said television signal, and said reference signal generating means comprises means for generating a pulse signal having the same waveform as that of the original transmitted waveform corresponding to said serrated portion extracted by said extracting means.

4,044,382

TRANSMITTING SYSTEM FOR FACSIMILE AND THE LIKE

Tohmi Yagishita, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 13, 1975, Ser. No. 604,100
Claims priority, application Japan, Aug. 20, 1974, 49-95158
Int. Cl.² H04N *7/12*
U.S. Cl. 358—260 **3 Claims**



1. A transmitting system for facsimile comprising:

a. a first shift register (6) the input of which is connected to an image signal terminal through a binary converter (5),

b. a ring-register (13) for storing a predetermined pattern of synchronizing signals,

c. a second shift register (8) whose input is connected to said first shift register (6) through an OR circuit (7) so that each place of the second shift register (8) is written one whenever at least one place of the first shift register (6) is one, thus enabling the second shift register (8) to store a pattern of a group weight indicator signal,

d. a third shift register (9) whose input is connected to said first shift register (6), for receiving the content of said first shift register (6) only when the first place of said second shift register (8) is one,

e. an OR circuit (12) whose output is connected to the output of the transmitting system and whose inputs are connected to the outputs of said ring register (13), said second shift register (8) and said third shift register (9), respectively, and

f. switching means (14, 15, 16) for controlling the operation of said ring register 13, said second shift register (8) and said third shift register (9).

4,044,383

METHOD AND APPARATUS FOR SYNCHRONIZING FACSIMILE TRANSCEIVERS

John M. Vandling, Pleasantville, N.Y., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 493,119, July 30, 1974, abandoned.
This application Apr. 12, 1976, Ser. No. 676,369
Int. Cl.² H04N *1/36*; G01D *15/34*
U.S. Cl. 358—264 **42 Claims**

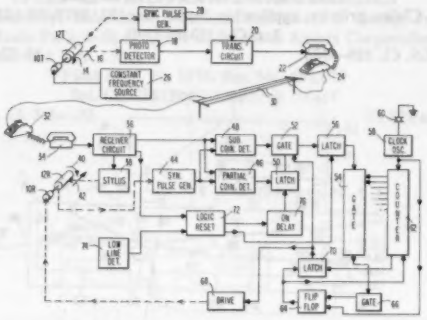
1. A method of achieving synchronization in a facsimile system comprising a receiver having a rotatably driven drum for receiving a copy medium and information writing means juxtaposed to various angular positions of the receiver drum as the drum is rotated, a transmitter having a rotatably driven drum for receiving a document and information sensing means juxtaposed to various angular positions on the transmitter drum as the transmitter drum is rotated, and a communications link carrying signals between the transmitter and the receiver, the method comprising the following steps:

rotatably driving one drum at a first angular frequency and another drum at a second angular frequency, the first angular frequency and the second angular frequency having a first frequency differential;

generating first synchronizing pulses corresponding to a predetermined angular position of one transmitter drum;

generating second synchronizing pulses corresponding to a predetermined angular position of the other drum;

first detecting a degree of coincidence in time between said first synchronizing pulses and at least a portion of said second synchronizing pulses;



rotatably driving said other drum at a third angular frequency in response to the first coincidence detection, the differential between said third angular frequency and said first angular frequency being substantially less than the differential between said second angular frequency and said first angular frequency;

subsequently detecting a more substantial degree of coincidence in time than first detected between said first synchronizing pulses and said second synchronizing pulses; and

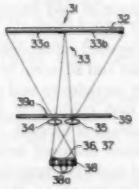
rotatably driving said other drum at said first angular frequency in response to the subsequent detection.

4,044,384

OPTICAL SCANNING APPARATUS

Toshiyuki Inokuchi, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed July 23, 1976, Ser. No. 707,962
Claims priority, application Japan, July 24, 1975, 50-90542; July 31, 1975, 50-93728; July 31, 1975, 50-93730
Int. Cl.² H04N *1/10, 3/14*
U.S. Cl. 358—293 **10 Claims**



1. An optical scanning apparatus for producing a plurality of electrical signals representing a scan line of an original document, comprising:

a photosensitive array including a plurality of photosensitive elements for producing said electrical signals respectively;

first optical means for focussing a first image of a first half of

the scan line onto the photosensitive array coextensively therewith;

second optical means for focussing a second image of a second half of the scan line onto the photosensitive array coextensively therewith; and

optical switching means for alternatingly blocking the first and second images.

4,044,385

PRINTING PLATE PRODUCTION APPARATUS

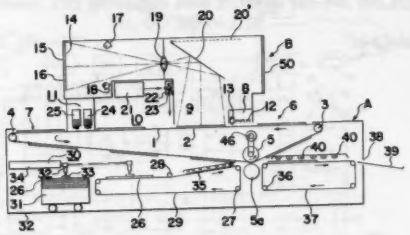
Masakatsu Nishimura, Settsu; Shin Saito; Kunsei Tanabe, both of Hirakata; Yasusi Umeda, Osaka; Seiji Arimatsu, Kyoto, and Yasuyuki Takimoto, Takatsuki, all of Japan, assignors to Nippon Paint, Osaka, Japan

Filed Mar. 15, 1976, Ser. No. 667,144

Claims priority, application Japan, Dec. 22, 1975, 50-153772

Int. Cl.[2] H04N *1/30*

U.S. Cl. 358—300 **10 Claims**



1. Printing plate production apparatus with employment of a photoconductive insulating sheet including a conductive base having a coating of a photoconductive insulating material thereon, said photoconductive insulating material being capable of varying its resistance from high to low by light, comprising:

a photoconductive insulating sheet transport means for conveying the photoconductive insulating sheet through the apparatus, said transport means being provided with both a loading station and an unloading station for said sheets, said stations being spaced apart along the path formed by said transport means;

a corona discharge means disposed adjacent and subsequent said loading station by which a charge is trapped on said coating where said photoconductive material is in said high condition;

image information-carrying light emission and scanning means disposed subsequent to said corona discharge means, said light emission and scanning means having modulating means for varying the amount of light in response to a transmitted original document signal and writing means for forming a latent image by applying light to selected regions of said coating, in an amount sufficient to vary the resistance of said photoconductive insulating material from said high to low;

developing means disposed subsequent to said light emission and scanning means and adjacent to said unloading station for applying toner particles to said photoconductive sheet which cling to said coating at said selected regions, whereat a latent image is formed;

optical exposing means disposed between said corona discharge means and said light emission and scanning means for forming latent image to the previously prepared charged photoconductive insulating sheet by using said developed image as master copy;

transferring means disposed subsequent to said developing means through said unloading station for conveying the said developed powder images from the surface of the said photoconductive material sheet directly to the surface of the printing plates, passing through between two rolls, and applying uniform pressure along their moving line of contact;

printing plate transport means disposed adjacent said transferring means for transport of said printing plates through said transfer station; and

control means connected to the said each means, corona discharge means, writing means, modulating means, exposing means, developing means, transferring means, and transport means of photoconductive sheet and printing plate.

4,044,386

TAPE CASSETTE WITH ERASE INHIBIT PLUG

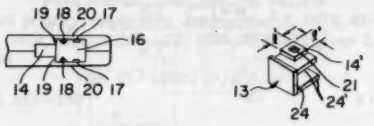
Takateru Satou, and Haruo Shiba, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Apr. 22, 1976, Ser. No. 679,369

Claims priority, application Japan, Apr. 22, 1975, 50-54881[U]

Int. Cl.[2] G11B *15/04, 23/06*

U.S. Cl. 360—60 **4 Claims**



1. A tape cassette comprising:

means defining an accidental erasure preventive slot having at least one ridge member and at least one projecting member on an internal wall thereof;

means defining a bias changeover slot adjacent to said accidental erasure prventive slot; and

a U-shaped snap for selectively closing and opening said accidental erasure preventive slot while not disturbing said bias changeover slot and having a base and two arms upstanding therefrom;

means for retaining said U-shaped snap within the accidental erasure preventive slot in either of two positions whereby said base of U-shaped snap is disposed at the opening of the accidental erasure preventive slot when the said accidental erasure preventive slot is to be kept in an inoperative state, and said base of the U-shaped snap is set against the wall of the accidental erasure preventive slot being disposed opposite the bias changeover slot when said accidental erasure preventive slot is to be kept in an operative state.

4,044,387

MAGNETIC HEAD SWITCHING SYSTEM

Lee A. Watkins, San Jose, and Larry M. Jacob, Los Altos, both of Calif., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,701

Int. Cl.[2] G11B *15/12*

U.S. Cl. 360—61 **2 Claims**

1. A combined magnetic recording and reading system for recording data on and reading data from a magnetic recording medium, said system comprising:

a read/write head capable of recording data on the magnetic recording medium responsive to electrical signals and for generating electrical signals responsive to reading data from the recording medium;

a write driver circuit for generating electrical signals for causing the read/write head to record data on the medium;

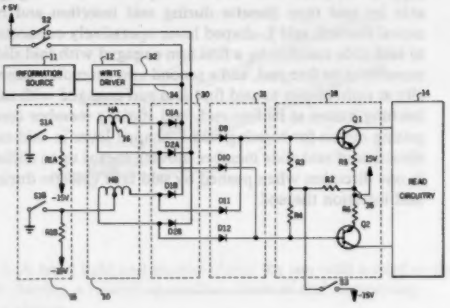
a read circuit for processing electric signals generated by the read/write head reading recorded data from the medium;

a first switching circuit connecting the write driver circuit to the read/write head;

a second switching circuit connecting the read circuit to the read/write head;

switching means in the first and second switching circuits; and

means for energizing said switching means operable to open the switching means in the first switching circuit while the



read/write head is reading data and for opening the switching means in the second switching circuit when the read/write head is recording data thereby to prevent the electrical signals of the read circuit and write driver circuit from being transmitted through the other switching circuit.

4,044,388

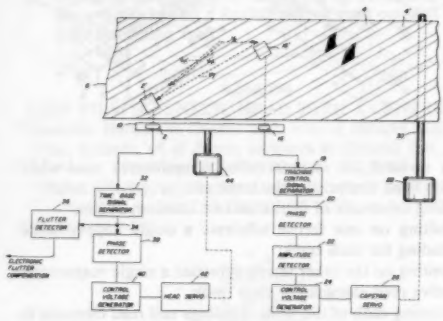
INTERACTIVE SERVO CONTROL SYSTEM FOR USE WITH A ROTATING-HEAD MAGNETIC TAPE PLAYER

Lenard M. Metzger, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 5, 1976, Ser. No. 729,621

Int. Cl.[2] H04N *5/795*; G11B *21/04*

U.S. Cl. 360—70 **6 Claims**



1. In a servo control system for use with a rotary head magnetic tape player having a rotary playback head that reproduces an information signal from slant tracks on a magnetic tape, the information signal having a signal component thereof with a parameter dependent upon variations in the speed of head rotation, the tape player also having a rotary tracking control head that overlaps adjacent slant tracks for providing a tracking control signal to a capstan servo apparatus whereby the tape speed is so maintained that the playback head overlies a recorded slant track when the tracking control head is in a predetermined overlapping position, the improvement comprising:

means responsive to the signal component in the information signal for generating a time base control signal for regulating the speed of the rotary playback head;

means responsive to said time base control signal for so adjusting the rotation of the playback head that the signal component parameter substantially assumes a predetermined value; and

interactive means associating the rotary playback head with the rotary tracking head for changing the overlapping position of the tracking head from its predetermined position relative to said adjacent tracks in response to a change in the rotational speed of the playback head, and for thereby causing a modification of the tracking control signal, whereby the capstan servo so adjusts the tape speed that the playback head regains its predetermined position overlying a recorded slant track.

4,044,389

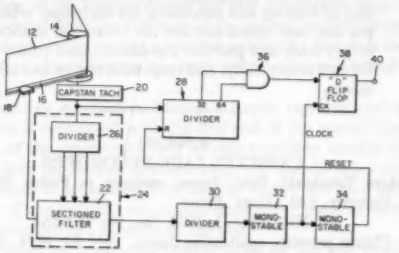
METHOD AND APPARATUS FOR MEASURING THE SPEED AT WHICH A TAPE WAS RECORDED

Reginald W. Oldershaw, Los Altos, and Edwin S. Busby, Jr., Menlo Park, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Mar. 19, 1976, Ser. No. 668,677

Int. Cl.[2] G11B *15/52, 15/46, 15/54*

U.S. Cl. 360—73 **13 Claims**



1. A method for measuring the standard recording speeds of a tape in a tape recorder/reproducer upon motion of the tape, wherein the recorder/reproducer includes a capstan tach for providing tach pulses and a multiple frequency control track recorded on the tape, comprising the steps of;

extracting a selected control track frequency from the control track;

generating a selected control track averaging period in response to the capstan tach which period is a function of the control track frequency;

generating a predetermined count of the tach pulses commensurate with the control track averaging period, which count is a function of a capstan tach frequency;

measuring the ratio of the capstan tach frequency relative to the control track frequency; and

generating logic levels indicative of the ratio measured and thus of the recording tape speed.

4,044,390

CARTRIDGE LOADING AND UNLOADING DEVICE USE IN CARTRIDGE TYPE TAPE RECORDERS

Masakazu Yamashita, Iwaki, Japan, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sept. 15, 1975, Ser. No. 613,713

Claims priority, application Japan, Sept. 26, 1974, 49-116024

Int. Cl.[2] G11B *25/06, 23/04*

U.S. Cl. 360—93 **9 Claims**

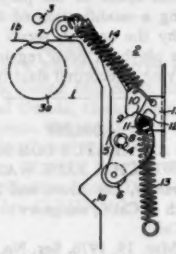
1. In a cartridge type tape recorder in which a cartridge is located in an operational position by having a holder engage a V-shaped notch in the cartridge, and improved cartridge loading and unloading device comprising:

a rotary member rotatably attached to a chassis and provided with a holder means and a responder means, said holder means and said responder means integrally rotatable with said rotary member and said holder means positioned for selectively engaging and disengaging a V-

shaped notch in a cartridge in association with the rotational motion of said rotary member, said responder means positioned for engaging a portion of the cartridge upon the insertion thereof and rotating said rotary member;

a floating pin disposed movable relative to the chassis; and

spring means for urging said pin against said rotary member;



said rotary member having at least one recess formed therein for selectively engaging said pin in response to the operation of loading and unloading the cartridge, wherein said pin and said recess restrain the rotational motion of said rotary body and provide a predetermined rotary position for said rotary body, said responder means and said holder means.

4,044,391

CASSETTE TAPE RECORDERS

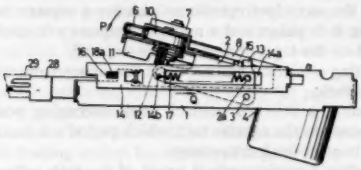
Akira Takahashi, Seki, Japan, assignor to Fulton Electronic Industry, Ltd., Aichi, Japan

Filed Mar. 3, 1975, Ser. No. 554,864

Claims priority, application Japan, July 30, 1974, 49-87841; July 30, 1974, 49-87842

Int. Cl.[2] G11B *15/00, 15/18*

U.S. Cl. 360—96 **7 Claims**



1. In combination with a cassette tape recorder of the type in which a first stationary chassis and a second stationary chassis spaced above said first stationary chassis defined therebetween a space adapted to receive a tape cassette therein, and in which a tape driving mechanism is mounted on a movable chassis rotatably supported on said first stationary chassis, the improvement which comprises:

an elongate slide member slidably attached to one side wall of said first stationary chassis;

a first tension spring fastened to said movable chassis at its one end and to said slide member at its other end;

means rotatably supported on said second stationary chassis and operatively connected with said slide member for rotation in one direction to move said slide member in one direction for urging said movable chassis into one position under the action of said first tension spring during insertion of said tape cassette into said space;

means engaged with said slide member moving means for latching it to maintain said movable chassis in said one position;

means for acting on said latching means for unlatching said slide member moving means to permit movement of said slide member in the other direction under the action of said first tension spring; and

means engaged by said slide member for rotating said movable chassis into another position under the action of said first tension spring during removal of said tape cassette from said space; and wherein

said slide member moving means comprises an L-shaped lever rotatably supported at its corner by a pin on said second stationary chassis, and a starting member slidably supported by said second stationary chassis and engageable by said tape cassette during said insertion and removal thereof, said L-shaped lever operatively connected to said slide member by a first arm engaged with said slide member at its free end, and a second arm extending generally at right angles to said first arm and engaged with said latching means at its free end, said starting member comprising means for rotating said L-shaped lever in said one direction of said slide member moving means upon sliding in one direction when pushed by said tape cassette during said insertion thereof.

4,044,392

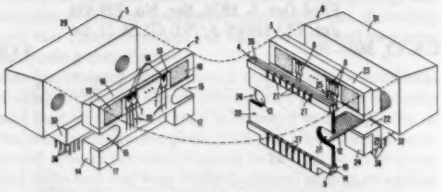
PROCESS FOR MAKING A READ-WHILE-WRITE TAPE HEAD AND THE PRODUCT MADE THEREBY

George W. Brock; Frank B. Shelledy, and Arthur B. Wills, all of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 14, 1975, Ser. No. 604,689

Int. Cl.[2] G11B *5/221*

U.S. Cl. 360—113 **7 Claims**



1. A method for manufacturing a multitrack read-while magnetic head comprising the steps of:

bonding substrates of ferrite on two titanium bodies;

depositing on one ferrite substrate a single copper write winding for each track;

depositing on the other ferrite substrate a single magnetoresistive read element for each track;

connecting each of the write windings and read elements to a separate write connector block and a read connector block via a pair of wires;

brazing a silver-copper sheet between a pair of ferrite layers, one of which contains glass-filled slots, thereby forming a center section which resists feedthrough, and forming a yoke which provides a magnetic closure;

assembling the sheet between the two substrates such that the ferrite layers of the center suction cooperate with respective ones of the ferrite substrates to form a magnetic head.

applying low viscosity epoxy from the outside of the bodies;

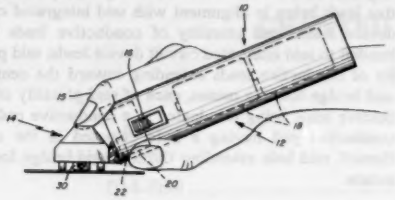
squeezing the bodies together between two titanium end pieces fastened by titanium bolts; and

forming a surface contour on the head by grinding and lapping the ferrite substrates and center section while simultaneously monitoring the resistance of the read elements.

4,044,393
HAND GUIDED TAPE PLAYER

Charles R. Budrose, Melrose, Mass., assignor to Upaya, Inc., Saugus, Mass.

Filed July 14, 1975, Ser. No. 595,521
Int. Cl.[2] G11B *21/02, 5/10*
U.S. Cl. 360—117 13 Claims

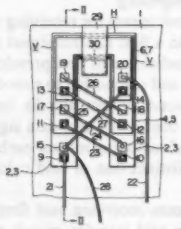


1. A hand held and guided player for use with a card or the like having a recording medium thereon and comprising:
a chassis,
a transducer means,
means for mounting the transducer means on said chassis in a position so that said transducer means can contact said medium and including biasing means for urging the transducer means downwardly,
wheel means extending at least in part below the chassis for supporting the chassis for movement over the recording medium surface,
means for coupling driving power to the wheel means for propelling the chassis at a predetermined fixed rate,
means coupled from said transducer means for providing an audio sound corresponding to a message recorded on the recording medium,
and a first housing covering said chassis and a second housing containing at least part of said means for propelling,
said means for supporting including at least two wheels and an interconnecting shaft, said means for propelling including a motor having a flexible output shaft coupled to said interconnecting shaft.

4,044,394
THIN FILM MAGNETIC HEAD WITH A CENTER TAP

Masanobu Hanazono; Osamu Asai, both of Hitachi, and Kunio Ono, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 5, 1976, Ser. No. 673,523
Claims priority, application Japan, Apr. 7, 1975, 50-41304
Int. Cl.[2] G11B *5/20, 5/28*
U.S. Cl. 360—123 5 Claims

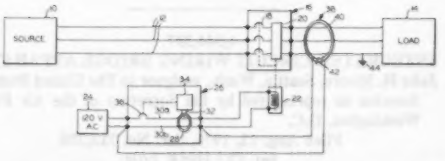


1. A magnetic head comprising:
a substrate;
magnetic core means superimposed on said substrate such that it elongates from a margin portion of said substrate perpendicularly to a direction of movement of a recording medium and is arranged so as to define a magnetic gap at one end of said magnetic core means on the margin portion of said substrate and come into magnetic connection with said substrate on the other end of said magnetic core means;
an even number of laminated conductive films each having a first portion extending to cross said magnetic core means and a second and a third portion respectively extending from the opposite ends of said first portion perpendicularly to the margin portion of said substrate;
insulating films provided among said conductive films so as to insulate said conductive films from one another;
connecting conductors for successively connecting said conductive films in such a manner that, assuming said conductive films are numbered in order from the top to the bottom, the free end of the second portion of the first one of said conductive films is connected with the free end of the third portion of the third one of said conductive films, the free end of the second portion of the second one of said conductive films is connected with the free end of the third portion of the fourth one of said conductive films, the free end of the second portion of the third one of said conductive films is connected with the free end of the third portion of the fifth one of said conductive films and the same manner is repeated till the free end of the third portion of the bottom one of the said conductive films is connected with the free end of the second portion of the conductive film having a number smaller by two than the number of said bottom one so as to form two sections of a coil;
a connecting conductive having a center tap, one end of which is connected with the free end of the second portion of the conductive film having a number smaller by one than the number of said bottom one and the other end of which is connected with the free end of the third portion of the second one of said conductive films so as to connect the two sections of the coil;
a first head-out conductor connected at its one end to the free end of the third portion of said first one of said conductive films, and
a second lead-out conductor connected at its one end to the free end of the second portion of said bottom one of said conductive films.

4,044,395
GROUND FAULT PROTECTION SYSTEM

Gregory C. Eckart, Southington, Conn., assignor to General Electric Company, New York, N.Y.

Filed Aug. 2, 1976, Ser. No. 710,391
Int. Cl.[2] H02H *3/28*
U.S. Cl. 361—44 8 Claims



1. A protection system for an electrical power distribution circuit, said system comprising, in combination:
A. a circuit breaker having contacts connected in the distribution circuit;
B. an actuator operable to open said breaker contacts and interrupt current flow in the distribution circuit;
C. a control circuit for said actuator;
D. a GFCI device including
1. contacts connected in said control circuit,
2. a differential current transformer having a primary winding connected in series with each of the two sides of said control circuit and a secondary winding in which is developed an output signal indicative of an

imbalance in the currents flowing in said primary windings,

3. means responsive to said output signal for opening said device contacts to interrupt said control circuit; and

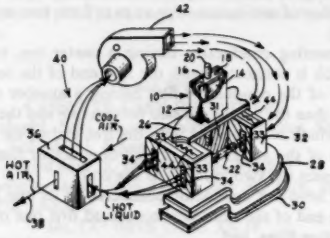
E. a ground fault sensor coupled with the distribution circuit and having an output connected across one of said primary windings, said sensor developing in response to a ground fault on the distrubution circuit a current signal in said one primary winding effective to create a current imbalance in said differential current transformer, whereby said device contacts open to interrupt said control circuit and said actuator operates to effect opening of said breaker contacts.

4,044,396

HEAT PIPE COOLING OF AIRBORNE PHASED ARRAY RADAR

James L. Haws; Douglas W. Quinney, both of Plano, and Frank A. Richards, Dallas, all of Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 14, 1975, Ser. No. 604,530
Int. Cl.[2] H05K *7/20*
U.S. Cl. 361—385 3 Claims



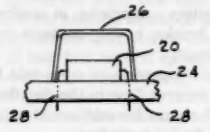
1. A system for controlling temperature in individual miniature modules comprising: a module having a case forming an enclosure, a pair of parallel panels positioned in the case, electronic circuitry mounted on said panels between each panel and the case, and means mounted in juxtaposition and between said panels for heat transfer, said means extending beyond the limits of said case in at least one direction, forming an extension; a fluid heat transfer medium; means supporting said module and having said fluid medium pass therethrough and operatively associating with the heat transfer means extension, thereby removing heat from said module.

4,044,397

INTEGRATED CIRCUIT WIRING BRIDGE APPARATUS

John H. Moore, Seattle, Wash., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 12, 1976, Ser. No. 713,750
Int. Cl.[2] H05K *1/04*
U.S. Cl. 361—398 5 Claims



1. A wiring bridge apparatus comprising in combination:

a bridge forming means mounted over an integrated circuit device, said bridge forming means only contacting the leads of said integrated circuit device, said bridge forming means being formed from a base material, said base material being non-conductive, and,

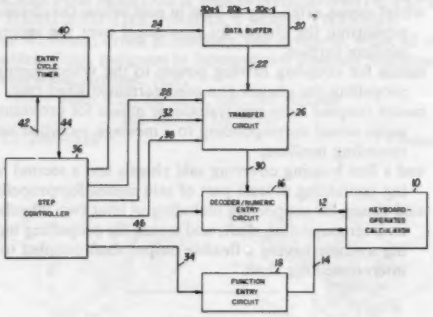
a plurality of conductive leads bonded to said bridge forming means, said plurality of conductive leads extending around the edge of said bridge forming means and being disposed on both sides thereof, said plurality of conductive leads being in alignment with said integrated circuit device leads, said plurality of conductive leads being bonded to said integrated circuit device leads, said plurality of conductive leads extending toward the center of said bridge forming means, each of said plurality of conductive leads being terminated in a conductive pad, said conductive pad having a hole disposed in the center thereof, said hole extending through said bridge forming means.

4,044,398

SYSTEM FOR INTERFACING KEYBOARD-OPERATED APPARATUS WITH ELECTRICAL DATA SIGNALS

Szee Ming Yao, Norwalk, Conn., assignor to Abbott Coin Counter Co., Inc., Greenwich, Conn.

Filed Jan. 9, 1976, Ser. No. 647,860
Int. Cl.[2] G06F *1/00*
U.S. Cl. 364—900 8 Claims



1. In combination, for processing information contained in manipulative input signals or electrical data signals:

a. a calculator having a keyboard and switches manually operable by depression of keys of said keyboard for entry of said manipulative input signals in said calculator; and

b. a system for entry of said electrical data signals in said calculator, comprising

1. transfer circuit means for receiving said data signals and responsive to a first control signal to provide first output signals indicative of first preselected content of said data signals and responsive to a second control signal to provide second output signals indicative of second preselected content of said data signals,

2. a plurality of switching means, each connected in parallel with a distinct one of said calculator key-operable switches,

3. decoder means receiving said first and second output signals from said transfer circuit means for operating said switching means in accordance with such preselected information contents of said data signals for entry of said contents in said calculator; and

4. step controller means for generating said first and second second control signals successively in predetermined time-spaced relation, and for maintaining said switching means unoperated for a preselected time period following each such operation thereof.

DESIGN PATENTS

GRANTED AUGUST 23, 1977

ERRATA

For CLASS	See PATENT NO.
014–059	245,520
024–064	245,537
024–034	245,538
024–062	245,539
024–062	245,540
024–038	245,541
024–038	245,542
024–054	245,543
028–025	245,544
029–008	245,545

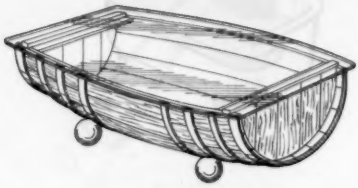
DESIGNS

AUGUST 23, 1977

245,461
SHOULDER WALLET
Jack Jones, Jr., Decatur, Ga., assignor to Jones, Sr., Jack, Decator, Ga.
Filed Feb. 11, 1976, Ser. No. 657,029
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—383

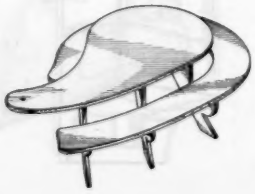
245,462
CLEANING BRUSH FOR A DRY SHAVER
Karl Peter Günter Hauf, Klagenfurt, Viktring, and Werner Karl Hofmeister, Klein St. Paul, both of Austria, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 24, 1976, Ser. No. 660,837
Claims priority, application Netherlands, Aug. 29, 1975, 7550516
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—10

245,463
COMBINED COFFEE TABLE AND PLANTER
Stephen L. Smedley, 1030 5th Ave., Chula Vista, Calif. 92011
Filed Nov. 3, 1975, Ser. No. 627,932
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—4

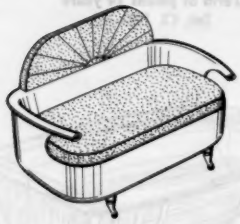


245,464
PROTECTIVE SHIELD FOR USE WITH RADIOACTIVE MATERIALS
Meyer M. Reiss, 29 Lake Ave., Center Moriches, N.Y. 11931
Filed Feb. 17, 1976, Ser. No. 658,511
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—27

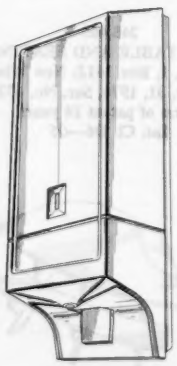
245,465
COMBINED TABLE AND SEATING UNIT
Wayne E. Hindle, Rte. 1, Box 141J, New Windsor, Md. 21776
Filed Mar. 31, 1976, Ser. No. 672,396
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—45



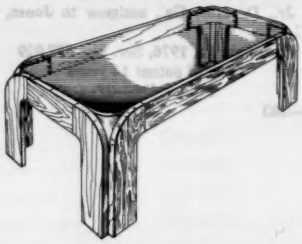
245,466
LOVE SEAT
Salvatore M. Asaro, 2334 Caminito Eximio, San Diego, Calif. 92107
Filed Feb. 2, 1976, Ser. No. 654,073
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—74



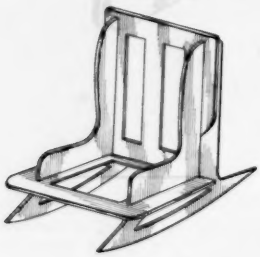
245,467
LIQUID DISPENSER
John R. Frassanito, 9400 Fredericksburg, San Antonio, Tex. 78240
Filed June 18, 1976, Ser. No. 697,523
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D6—95



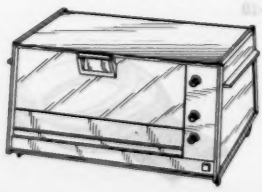
245,468
TABLE
Norton Jay Horwitz, Knoxville, Tenn., assignor to Silver Manufacturing, Inc.
Filed June 23, 1976, Ser. No. 699,061
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175



245,469
PLANTER
Paul Smilko, 133-68 Hook Creek Blvd., Rosedale, N.Y. 11422
Filed Nov. 3, 1975, Ser. No. 627,840
Term of patent 14 years
Int. Cl. D6—*06, 01;* D11—*02*
U.S. Cl. D6—182



245,470
TOASTER OVEN
Robert O. Ernest, Oak Park, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Dec. 31, 1975, Ser. No. 645,686
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—91



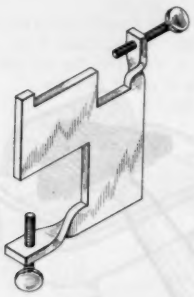
245,471
SCOOP
John W. MacInnis, 711 30th Ave., and J. Thomas MacInnis, 702 17th St., both of Monroe, Wis. 53566
Filed Mar. 15, 1976, Ser. No. 666,937
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—104

245,472
COMBINED KNIFE AND CHOPSTICK
Wayne E. Jensen, Homewood, Ill., assignor to B & J Rocket (Hong Kong) Limited, Hong Kong
Division of Ser. No. 521,976, Nov. 8, 1974, Pat. No. Des. 242,760.
This application July 16, 1976, Ser. No. 705,753
Claims priority, application United Kingdom, May 17, 1974, 966677/74
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—149

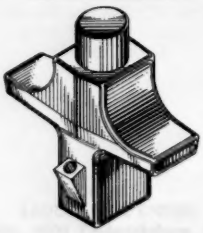
245,473
MOP HEAD
Francine F. Heninger, 968 Terrace Hills Drive, Salt Lake City, Utah 84103
Filed Apr. 9, 1976, Ser. No. 675,373
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—178

245,474
ADHESIVE DISPENSER
Charles H. Scholl, Vermilion, Ohio, assignor to Nordson Corporation, Amherst, Ohio
Filed Apr. 7, 1975, Ser. No. 565,933
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—30

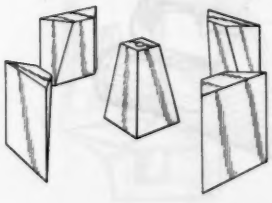
245,475
SKI VISE
Ronald D. Bourgeois, 38 Ellison Park, Waltham, Mass. 02154
Filed Feb. 19, 1976, Ser. No. 659,420
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—72



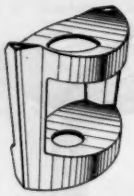
245,476
GOLF TEE SHARPENER
David Francis Cammarota, 2233 Broad Hollow Road, Farmingdale, N.Y. 11735
Filed Feb. 6, 1976, Ser. No. 655,686
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—91



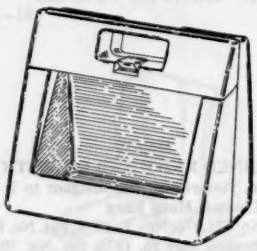
245,477
GROUND ANCHOR TIE-DOWN FOR MOBILE HOMES AND THE LIKE
Earnest R. Mullenax, P.O. Box 32349, Warr Acres Branch, Oklahoma City, Okla. 73132
Filed Jan. 14, 1974, Ser. No. 433,001
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—382



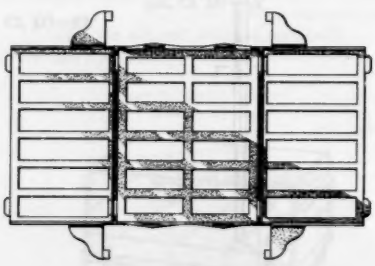
245,478
COLLAPSIBLE DISPLAY CARTON
Christopher John Clough, 113 Welbeck Drive, Great Horton, Bradford 7, Yorkshire, England, and Eric Jackson, 10 Rockville Drive, Embsay, Skipton, Yorkshire, England
Filed July 29, 1975, Ser. No. 600,040
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224



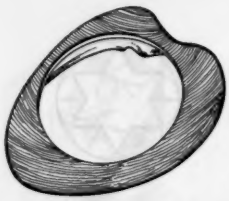
245,479
DISPLAY CASE
Donald A. Malcolm, Roanoke Rapids, N.C., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Sept. 12, 1975, Ser. No. 612,829
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224



245,480
FOLDING DISPLAY BASKET FOR CARTONED PRODUCTS
John B. Brush, North College Hill, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed June 4, 1975, Ser. No. 583,846
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—248

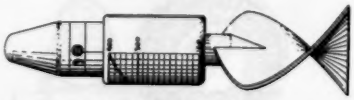


245,481
QUAHOG SIZING RING
Anthony Ronci, 38 Elmdale Ave., Johnston, R.I. 02919, and Robert A. Petrucci, 95 Orlando Drive, North Providence, R.I. 02904
Filed Oct. 20, 1975, Ser. No. 624,172
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64

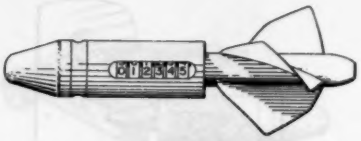


245,482
PITOT TUBE FITTING
Jan Flinta, Nykoping, and Gunnar Hernborg, Trosa, both of Sweden, assignors to Aktiebolaget Atomenergi, Nykoping, Sweden
Filed Sept. 25, 1975, Ser. No. 616,743
Claims priority, application Sweden, Mar. 26, 1975, 75648
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96

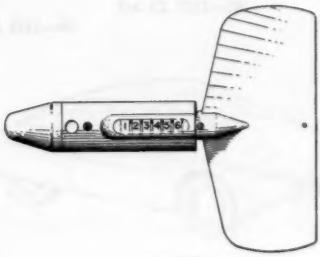
245,483
SHIELDED FLOW METER
Shale J. Niskin, 2941 Lucaya, Coconut Grove, Fla. 33133
Filed Mar. 29, 1976, Ser. No. 671,662
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96



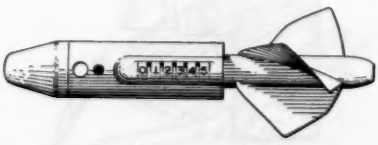
245,484
THREE BLADED CYLINDRICAL FLOW METER
Shale J. Niskin, 2941 Lucaya, Coconut Grove, Fla. 33133
Filed Mar. 29, 1976, Ser. No. 671,663
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96



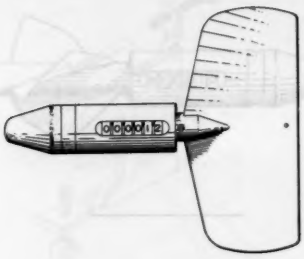
245,485
BAYED FLOW METER
Shale J. Niskin, 2941 Lucaya, Coconut Grove, Fla. 33133
Filed Mar. 29, 1976, Ser. No. 671,664
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96



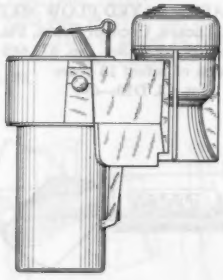
245,486
THREE BLADED BAYED FLOW METER
Shale J. Niskin, 2941 Lucaya, Coconut Grove, Fla. 33133
Filed Mar. 29, 1976, Ser. No. 671,665
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96



245,487
CYLINDRICAL FLOW METER
Shale J. Niskin, 2941 Lucaya, Coconut Grove, Fla. 33133
Filed Mar. 29, 1976, Ser. No. 671,666
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96



245,488
FIRE ALARM
Michael Pappas, Irvington; Paul A. Witte, and Thomas Johnson, both of Hopewell, all of N.J., assignors to Falcon Safety Products, Inc., Mountainside, N.J.
Filed Nov. 24, 1976, Ser. No. 744,801
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

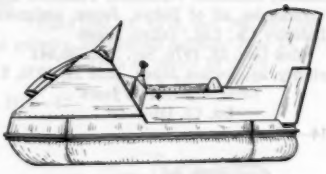


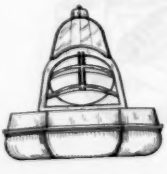
245,489
STAR RING OR SIMILAR ARTICLE
Harry Rimberg, 175 Willoughby St., Brooklyn, N.Y. 11201
Filed May 6, 1976, Ser. No. 683,885
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—26

245,490
ZODIAC CHARM
William S. Klitzner, 400 Narragansett Parkway, Warwick, R.I. 02888
Filed Jan. 19, 1976, Ser. No. 650,931
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—81

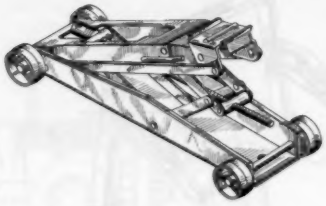
245,491
PLAQUE OR THE LIKE
Owen Siegel, 1517 Basswood Court, Glenview, Ill. 60025
Filed Mar. 16, 1976, Ser. No. 667,462
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—139

245,492
AIR CUSHIONED VEHICLE
Michael A. Clare, Toledo, Ohio, assignor to Windcraft Corporation, Maumee, Ohio
Filed Jan. 26, 1976, Ser. No. 652,065
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—5

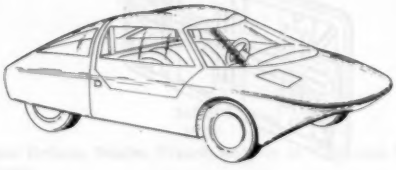




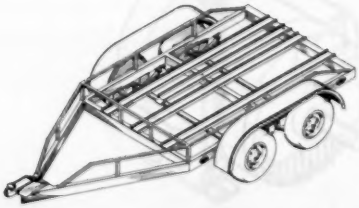
245,493
FLOOR JACK
Howard Kenig, Bristol, Pa., assignor to Gulf & Western Manufacturing Company (Systems)
Filed Nov. 19, 1975, Ser. No. 633,347
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—55



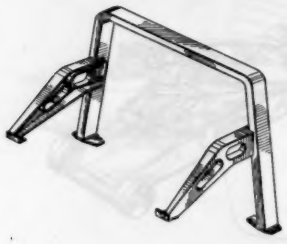
245,494
AUTOMOTIVE VEHICLE
Craig A. Selvidge, Edmonds, and Michael R. Seal, Bellingham, both of Wash., assignors to Western Washington State College, Bellingham, Wash.
Filed Feb. 6, 1976, Ser. No. 655,859
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—90



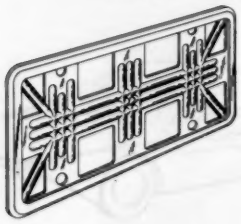
245,495
TRAILER
Thomas J. Henderson, P.O. Box 941, Pollock Pines, Calif. 95726
Filed Aug. 5, 1976, Ser. No. 711,846
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—101



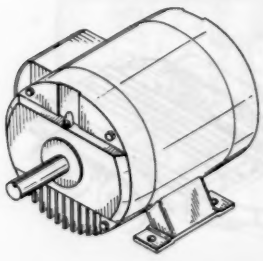
245,496
VEHICLE ROLL BAR UNIT
John Francis Wheeler, 9364 Jamacha Road, Spring Valley, Calif. 92077
Filed Apr. 5, 1976, Ser. No. 673,623
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



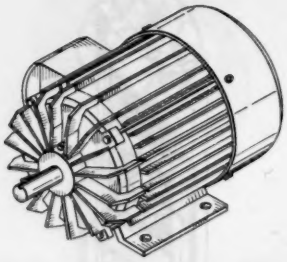
245,497
LICENSE PLATE HOLDER
Donald W. Ritch, 1531 Burgandy, Streamwood, Ill. 60103
Filed Jan. 19, 1976, Ser. No. 645,091
Term of patent 7 years
Int. Cl. D12—*16*
U.S. Cl. D12—193



245,498
HOUSING FOR ELECTRIC MOTOR
John C. Andreas, Des Peres, Mo., assignor to Gould Inc.
Filed Mar. 1, 1976, Ser. No. 662,531
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D13—1

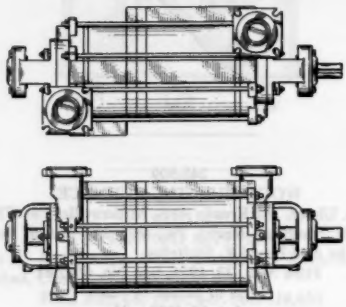


245,499
HOUSING FOR ELECTRIC MOTOR
John C. Andreas, Des Peres, Mo., assignor to Gould Inc.
Filed Mar. 1, 1976, Ser. No. 662,532
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D13—01

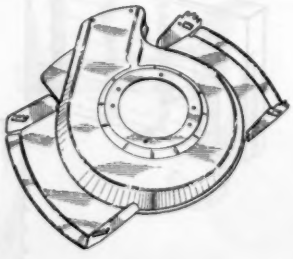


245,500
TELEPHONE SET
Hisao Fukushima; Katsuhito Watanabe; Yoshinori Kanda, and Tsutomu Watanabe, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Dec. 15, 1976, Ser. No. 750,641
Claims priority, application Japan, June 22, 1976, 51-23588
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—57

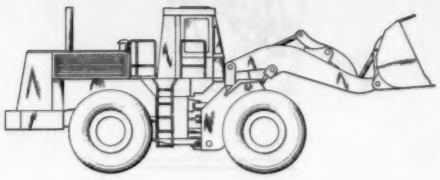
245,501
LIQUID RING PUMP
James B. Fitch, Marshfield, Mass., assignor to General Signal Corporation, Rochester, N.Y.
Filed Apr. 7, 1976, Ser. No. 674,532
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7



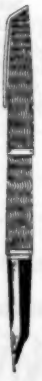
245,502
LAWN MOWER HOUSING
Jerker E. Oscarsson; Hans T. A. Ehrlin, and Christian G. Haggstam, all of Tranas, Sweden, assignors to Stiga AB, Tranas, Sweden
Filed Dec. 16, 1975, Ser. No. 641,200
Claims priority, application Sweden, June 18, 1975, 1254/75
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—17



245,503
TRACTOR LOADER VEHICLE
Stanley B. Adams, Yorkville; John M. Parks, Peoria, and James M. Reisel, Naperville, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Apr. 12, 1976, Ser. No. 675,657
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—25

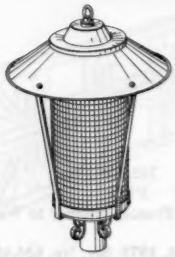


245,504
PEN
Eugene Defores, Nantes, France, assignor to Waterman, Paris, France
Filed Nov. 24, 1975, Ser. No. 634,464
Claims priority, application France, May 26, 1975, 75.73900
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—50

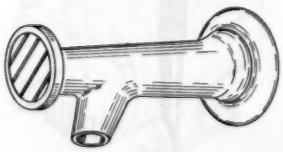


245,505
EDUCATIONAL TOY CLOCK
Maynard J. Bullock, 3106 Barth, Flint, Mich. 48504
Filed Sept. 2, 1975, Ser. No. 609,810
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—64

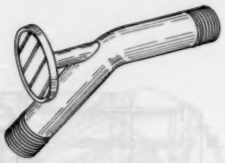
245,506
ELECTRONIC INSECT LAMP
Ted G. Kikoler, 47 Manchester Road, Kitchener, Ontario, Canada
Filed Apr. 7, 1976, Ser. No. 674,678
Term of patent 14 years
Int. Cl. D22—*06;* D26—*03*
U.S. Cl. D22—19



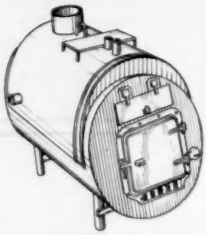
245,507
BATHTUB SPOUT
Lawrence E. Crow, 388 12th St., Oakland, Calif.
Filed Dec. 1, 1976, Ser. No. 746,382
Term of patent 14 years
Int. Cl. D23—*1*
U.S. Cl. D23—32



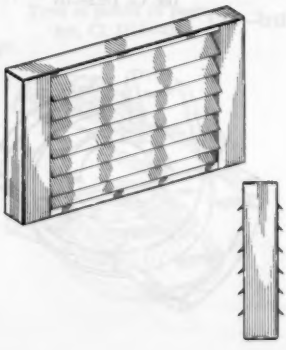
245,508
SHOWER SPOUT
Lawrence E. Crow, 388 12th St., Oakland, Calif.
Filed Dec. 1, 1976, Ser. No. 746,383
Term of patent 14 years
Int. Cl. D23—*1*
U.S. Cl. D23—32



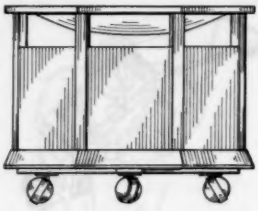
245,509
WOOD BURNING FURNACE
Robert G. Ulmer, 182 Kready Ave., Millersville, Pa. 17551, and David K. Stoltzfus, Ronks, Pa., assignors to said Robert G. Ulmer by said David K. Stoltzfus
Filed Mar. 23, 1976, Ser. No. 669,681
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—92



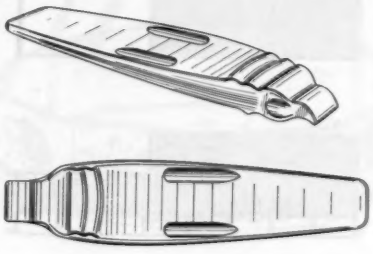
245,510
ELECTRIC RADIANT SPACE HEATER
Albert W. Herman, North Olmsted, and Joseph W. Adams, Westlake, both of Ohio, assignors to Bettcher Manufacturing Corporation
Filed Oct. 17, 1975, Ser. No. 623,376
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—113



245,511
COMBINED FURNITURE COMMODE AND ROOM FAN
Nolan Lewis, W. 2136 Riverside, Apt. 63, Spokane, Wash. 99201
Filed Dec. 22, 1975, Ser. No. 642,711
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—155



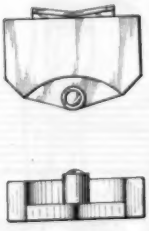
245,512
VENTILATED BITE STICK
William A. Kohl, Anza, Calif., assignor to Dyna Med, Inc., Carlsbad, Calif.
Filed Aug. 16, 1976, Ser. No. 714,633
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—10



245,513
ULTRASONIC TRANSDUCER PROBE
Leroy A. Kopel, McVeytown, Pa., assignor to Krautkramer-Branson, Incorporated, Stratford, Conn.
Filed Nov. 10, 1975, Ser. No. 630,634
Term of patent 14 years
Int. Cl. D24—*02;* D10—*04*
U.S. Cl. D24—17

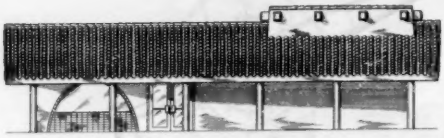
245,514
ULTRASONIC TRANSDUCER PROBE
Bradley Pennebaker, McClure, Pa., assignor to Krautkramer-Branson, Incorporated, Stratford, Conn.
Filed Jan. 29, 1976, Ser. No. 653,439
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17

245,515
LIGHT FOR VAGINAL SPECULUM
Vernon H. Troutner, St. Petersburg, and Raymond W. Simmons, North Pinellas Park, both of Fla., assignors to Concept, Inc.
Filed Nov. 21, 1975, Ser. No. 634,257
Term of patent 14 years
Int. Cl. D24—*02;* D26—*99*
U.S. Cl. D24—29

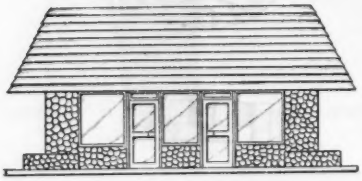


245,516
ARTIFICIAL CRUCIATE LIGAMENT
James T. Treace, Malibu, Calif., assignor to Richards Manufacturing Company, Inc., Memphis, Tenn.
Filed Jan. 21, 1976, Ser. No. 651,215
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—33

245,517
MEXICAN FOOD RESTAURANT STRUCTURE
Jerome A. Gary, Irvine, Calif., assignor to Taco Charley, Inc., San Mateo, Calif.
Filed Oct. 29, 1976, Ser. No. 736,847
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22

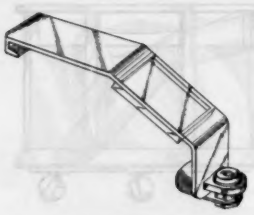


245,518
RESTAURANT BUILDING
Alvin C. Copeland, 5001 Folse Drive, Metairie, La. 70002
Division of Ser. No. 568,380, April 15, 1975. This application Dec. 6, 1976, Ser. No. 748,129
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—25

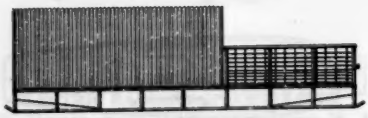


245,519
BURIAL FACILITY
Clyde C. Booth, 6001 NW. Highway, Oklahoma City, Okla. 73132
Filed Apr. 21, 1975, Ser. No. 569,862
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—33

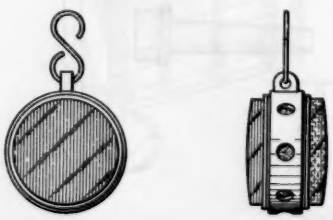
245,520
TELEPHONE LOCKING DEVICE
Albert H. Smith, and Randall S. Smith, both of 17736 Hatteras St., Encino, Calif. 91316
Filed July 23, 1976, Ser. No. 708,094
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—59



245,521
PORTABLE ANIMAL ENCLOSURE
Neil A. Koster, Rte. 1, Sylvia, Kans. 67581
Filed July 12, 1976, Ser. No. 704,462
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1

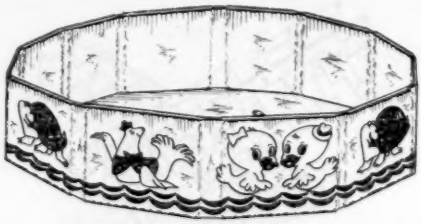


245,522
INSECT REPELLANT AND DISINFECTANT PENDANT FOR DOMESTIC ANIMALS
Dennis A. Mulkey, 2 Wharfside Road, Richmond, Va. 23228, and Robert E. Hatcher, 7300 Townes Road, Richmond, Va. 23229
Filed July 29, 2976, Ser. No. 709,885
Term of patent 3½ years
Int. Cl. D30—*08*
U.S. Cl. D30—43

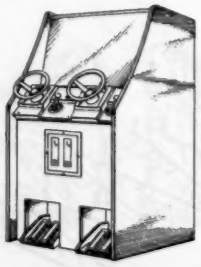


245,523
TOY FIGURE
Fredric C. Behling, 41 Washington St., West Barrington, R.I. 02890, and Paul J. Sullivan, 300 Metacom Ave., Bristol, R.I. 02809
Filed May 17, 1976, Ser. No. 687,244
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

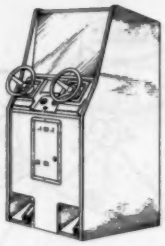
245,524
FOLDING SWIMMING POOL
Alan P. Friedlander, Searington, N.Y., assignor to Alvimar Manufacturing Co., Inc., Long Island City, N.Y.
Filed Sept. 30, 1975, Ser. No. 617,994
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 F



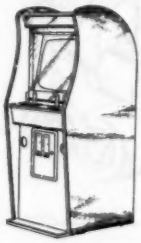
245,525
GAME CABINET
Ronald G. Wayne, 1900 California St., No. 4, Mountain View, Calif. 94040
Filed Jan. 26, 1976, Ser. No. 652,127
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 L



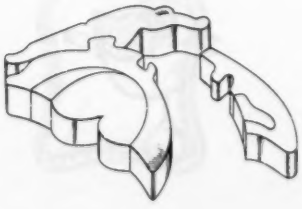
245,526
GAME CABINET
Kenneth W. Sauter, 17665A Del Monte Ave., Morgan Hill, Calif. 95037
Filed Jan. 26, 1976, Ser. No. 652,165
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 L



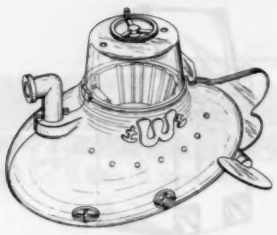
245,527
GAME CABINET
Kenneth W. Sauter, 17665A Del Monte Ave., Morgan Hill, Calif. 95037
Filed Feb. 6, 1976, Ser. No. 655,861
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 L



245,528
BUTTERFLY PUZZLE
Carol D. Milner, 7519 Beck Ave., North Hollywood, Calif. 91360
Filed Sept. 17, 1975, Ser. No. 614,259
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 M



245,529
TOY SUBMARINE
Robert H. Hudson, Seekonk, Mass., and George W. Ptaszek, Pascoag, R.I., assignors to Hasbro Development Corporation
Filed Jan. 12, 1976, Ser. No. 648,952
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 JJ

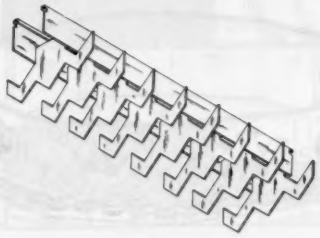


245,530
COMBINED TOY VEHICLE AND FIGURE THEREFOR
Edward M. Ferguson, Nashville, Tenn., assignor to Kusan, Inc., Nashville, Tenn.
Filed Apr. 23, 1976, Ser. No. 677,881
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AN

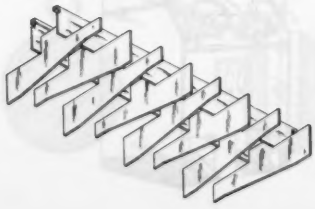
245,531
TOY BIRD
Masami Shiraishi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed May 13, 1976, Ser. No. 686,632
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 C

245,532
SWIM VEST WITH DORSAL FIN
Donald Taylor, 413 Auburn Ave., Altamonte Springs, Fla. 32701
Filed Nov. 21, 1975, Ser. No. 634,141
Term of patent 14 years
Int. Cl. D2—*02*; D21—*02*
U.S. Cl. D34—43

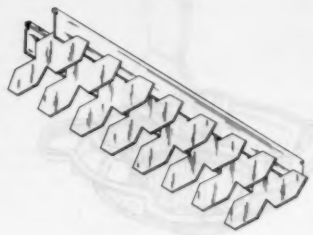
245,533
LIGHTING BAFFLE
Arthur W. Segil, 910 Skokie Blvd., Northbrook, Ill. 60062
Filed Apr. 2, 1976, Ser. No. 673,262
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 A



245,534
LIGHTING BAFFLE
Arthur W. Segil, 910 Skokie Blvd., Northbrook, Ill. 60062
Filed Apr. 2, 1976, Ser. No. 673,263
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 A

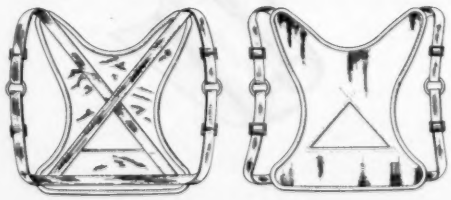


245,535
LIGHTING BAFFLE
Arthur W. Segil, 910 Skokie Blvd., Northbrook, Ill. 60062
Filed Apr. 2, 1976, Ser. No. 673,264
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 A

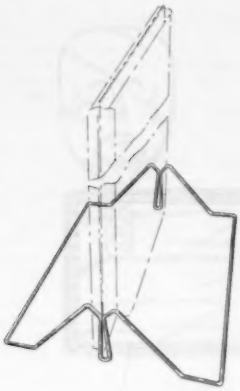


245,536
LIGHTING BAFFLE
Arthur W. Segil, 910 Skokie Blvd., Northbrook, Ill. 60062
Filed Apr. 2, 1976, Ser. No. 673,265
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 A

245,537
HUMAN BACK SUPPORT HARNESS
Donald Joseph Gurgiolo, P.O. Box 432, Islamorado, Fla. 33036
Filed Sept. 8, 1975, Ser. No. 611,000
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64

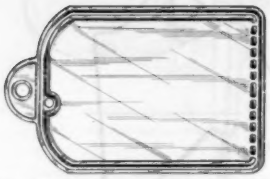


245,538
STAND FOR A DRAINAGE DEVICE
Leonard David Kurtz, Woodmere, and Robert Bidwell, Melville, both of N.Y., assignors to Deknatel, Inc., New York, N.Y.
Filed Sept. 8, 1975, Ser. No. 611,422
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—34

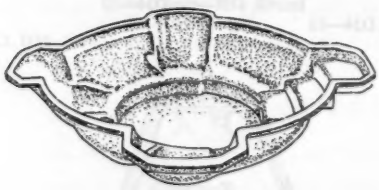


245,539
NEBULIZER-HUMIDIFIER BAG ASSEMBLY
Joseph W. Lindsey, Salt Lake City, Utah, assignor to Arbrook, Inc., Arlington, Tex.
Filed Nov. 26, 1975, Ser. No. 635,511
Term of patent 14 years
Int. Cl. D28—*01;* D24—*02*
U.S. Cl. D24—62

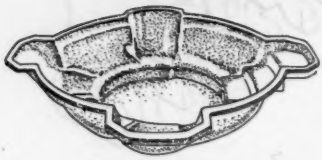
245,540
NEBULIZER BAG
Joseph W. Lindsey, Salt Lake City, Utah, assignor to Arbrook, Inc., Arlington, Tex.
Filed Nov. 26, 1975, Ser. No. 635,512
Term of patent 14 years
Int. Cl. D28—*01;* D24—*02*
U.S. Cl. D24—62



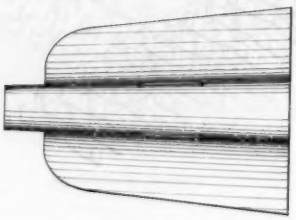
245,541
BATHING POOL
Merle C. Melchior, Los Angeles, Calif., assignor to Hydro-Spa, Inc., Encino, Calif.
Division of Ser. No. 434,433, Jan. 18, 1974, Pat. No. Des. 240,084.
This application Feb. 23, 1976, Ser. No. 660,768
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D24—38

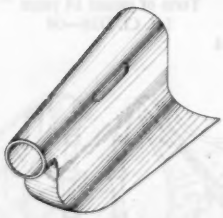


245,542
BATHING POOL
Merle C. Melcior, Los Angeles, Calif., assignor to Hydro-Spa, Inc., Encino, Calif.
Division of Ser. No. 434,433, Jan. 18, 1974, Pat. No. Des. 240,084.
This application Feb. 23, 1976, Ser. No. 660,769
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D24—38



245,543
PORTABLE URINAL
Raymond J. DeBurgh, P.O. Box 521-A, Rte. 2, Weslaco, Tex. 78596
Filed Apr. 23, 1976, Ser. No. 679,649
Term of patent 14 years
Int. Cl. D24—*05*
U.S. Cl. D24—54





245,544

COMBINED COMB AND BRUSH

Cleother Pittman, 11946 E. 164th St., Norwalk, Calif. 90650

Filed Feb. 27, 1976, Ser. No. 661,852
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—25

245,545

PROTECTIVE FACE MASK

Chen Ching Chou, 444 Lombard St., San Francisco, Calif. 94133

Filed Oct. 28, 1975, Ser. No. 625,956
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D29—8

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF AUGUST, 1977

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Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., 4,044,009, Cl. 260-251.00R.

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Baker, Charles Marvin; and Foster, Gene Bruce, to Boeing Company, The. Internal tooling for swaging apparatus. 4,043,160, Cl. 72-61.000.

Baker, Don R., to Stauffer Chemical Company. Organotin miticidal and insecticidal compounds. 4,044,025, Cl. 260-332.100.

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Baker, Robert C. Sheet structure. 4,044,180, Cl. 428-35.000.

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Ball Brothers Research Corporation: *See*—
Bartoe, Otto E., Jr., 4,043,523, Cl. 244-87.000.

Ballew, Audrey H., to Dallas County Association for the Blind. Method and apparatus for constructing a mop. 4,043,602, Cl. 300-16.000.

Balz, Werner: *See*—
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Bamford, Robert P., deceased; Herrington, Richard A.; and Oelke, Waldemar W., 4,043,782, Cl. 65-104.000.

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Barbee, Robert B., to Eastman Kodak Company. Grafting process for preparing a polyester fabric having desirable stain-release, antisoil-redeposition, antistatic and hydrophilic properties. 4,043,753, Cl. 8-115.500.

Barclay, Andrew Conway: *See*—
Potter, William Duncan; Barclay, Andrew Conway; Dunning, Reginald; and Parry, Richard John, 4,043,327, Cl. 128-89.00R.

Barker, Sidney Alan; and Gray, Charles John, to Koch-Light Laboratories, Ltd. Water insoluble biologically active material. 4,043,869, Cl. 195-63.000.

Barner, Herbert E.; Davies, David S.; and Szabo, Lester J., to Kennecott Copper Corporation. Two-stage fluid bed reduction of manganese nodules. 4,044,094, Cl. 423-32.000.

Barnes, Vernon M., Jr.: *See*—
Gilmer, William N.; and Barnes, Vernon M., Jr., 4,043,539, Cl. 259-4.0AB.

Baron, Arthur L.; and Sivaramakrishnan, Parameswar, to Mobay Chemical Corporation. Flame retardant polycarbonate having improved critical thickness. 4,043,980, Cl. 260-47.0XA.

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Barrett, John C.; and Gfroerer, Gerald T., to Raygo, Inc. Steering system for articulated vehicles. 4,043,422, Cl. 180-140.000.

Bartko, John; and Wonn, James W., to Westinghouse Electric Corporation. Method and apparatus for determining uranium concentration in a moving stream. 4,043,755, Cl. 23-230.00R.

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Huper, Fritz; Rauenbusch, Erich; Schmidt-Kastner, Gunter; Bomer, Bruno; and Bartl, Herbert, 4,044,196, Cl. 526-271.000.

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Bascope, Alberto H.; and Grizzard, Eugene H., to Burmah Oil and Gas Company. Clarification tank. 4,043,912, Cl. 210-83.000.

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Basile, Mario J. Method of treating soil for controlling termites and the like. 4,043,073, Cl. 43-124.000.

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Eisele, Judith A.; Eichbaum, Barlane R.; and Bauer, Donald J., 4,044,115, Cl. 423-631.000.

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Baumann, Gerard. Process for preparing precooked pasta products. 4,044,165, Cl. 426-557.000.

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for the preparation of stable polymeric images and process for making them by photopolymerization in a matrix. 4,043,819, Cl. 96-115.00P.

Baumgartner, Viktor, to Siemens Aktiengesellschaft. Method and apparatus for detecting the direction of incidence of electromagnetic radiation. 4,043,672, Cl. 356-152.000.

Baumstimler, August B. Safety sleeve. 4,043,150, Cl. 64-32.00R.

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Miller, John J.; Baus, Richard E.; and Lewis, Sheldon N., 4,044,190, Cl. 428-463.000.

Bausch & Lomb Incorporated: *See—*
Kadlecik, John; and Manning, Wayne R., 4,044,226, Cl. 219-521.000.

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Munsch, John Michael, 4,043,333, Cl. 128-214.00R.

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Bossert, Friedrich; Wehinger, Egbert; Stoepel, Kurt; Vater, Wulf; and Kazda, Stanislav, 4,044,141, Cl. 424-266.000.
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Bazin, Bernard, to Texas Instruments Incorporated. Method of fabrication of insulated gate field effect semiconductor devices. 4,043,848, Cl. 148-187.000.

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Kaufmann, Meinolph, 4,043,638, Cl. 350-160.0LC.

Bea, Karl J. Hydrostatic bearing lubrication system. 4,043,209, Cl. 74-60.000.

Beals, Charles E.; Chambers, Robert O.; Hanson, Edwin E.; and Satzler, Ronald L., to Caterpillar Tractor Co. Hydromechanical transmission. 4,043,227, Cl. 74-868.000.

Bearup, Charles D.; and Few, Marvin F., to Few, Marvin F. Rowing and steering device for boats. 4,043,291, Cl. 115-29.000.

Beatrice Foods Co.: *See—*
Carpentier, John H., 4,042,983, Cl. 4-291.000.

Beck, Charles K.; and Foote, Francis C., to Addressograph Multigraph Corporation. Secure property document and method of manufacture. 4,044,231, Cl. 235-61.12N.

Beck, William R.: *See—*
Suverison, Lyle B.; and Beck, William R., 4,043,630, Cl. 339-218.00M.

Becker, Albert E.: *See—*
Brown, Robert O.; and Becker, Albert E., 4,043,130, Cl. 60-655.000.

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Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., 4,044,144, Cl. 424-269.000.

Behrens, James D.: *See—*
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Bell & Howell Company: *See—*
Hapke, Kenyon A., 4,043,650, Cl. 353-15.000.
Herff, Anthony P., 4,044,328, Cl. 340-146.1AG.
Logue, Daniel R.; and Anderson, Terry G., 4,043,813, Cl. 96-1.800.
Morrison, Wilbur J.; and Tress, Norwood E., 4,043,551, Cl. 271-243.000.
Nayak, Ashok B., 4,044,369, Cl. 354-275.000.
Van Dam, John F.; and Pacholok, Jaroslaw, 4,043,859, Cl. 156-566.000.

Bell Telephone Laboratories, Incorporated: *See—*
Alkire, Richard Collin; Engelmaier, Werner; and Kessler, Thomas Jacob, 4,043,891, Cl. 204-231.000.
Berreman, Dwight Winton, 4,043,640, Cl. 350-160.0LC.
Rentzepis, Peter Michael, 4,044,252, Cl. 250-282.000.

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Wolnowsky, Howard E.; and Belland, Erling N., 4,044,204, Cl. 179-1.0SA.

Bendler, Hellmut; and Bretfeld, Anton, to Dynamit Nobel Aktiengesellschaft. Compressed-gas cartridge for fire protection purposes. 4,043,128, Cl. 60-636.000.

Bennett, John D.; and Galier, Thomas W., to Suntech, Inc. Anti-sticking tool for drill pipe. 4,043,410, Cl. 175-323.000.

Bennett, Robert P.; and O'Connor, Matthew J., to Apollo Chemical Corporation. Method of conditioning flue gas to electrostatic precipitator. 4,043,768, Cl. 55-5.000.

Benoit, Roland; and Polanski, John, to InterRoyal Corporation. Releasable support rod. 4,043,528, Cl. 248-251.000.

Benque, Jean-Pierre; Lallement, Jean; and Lambert, Paul, to Commissariat a l'Energie Atomique. Structure for reducing convection currents within the pressure vessel of a fast reactor. 4,043,867, Cl. 176-40.000.

Berenson, Herman: *See—*
Lies, Thomas Andrew; and Berenson, Herman, 4,044,127, Cl. 424-246.000.

Beresniewicz, Aleksander; and Inskip, Harold Kirkwood, to Du Pont de Nemours, E. I., and Company. Vinyl acetate-ethylene copolymer emulsions having improved water resistance. 4,043,961, Cl. 260-29.6WA.

Berg, Eric P., to Minnesota Mining and Manufacturing Company. Latentizing solvents for epoxy systems. 4,043,967, Cl. 260-30.4EP.

Berg, Klaus Peter: *See—*
Kiss, Joseph; and Berg, Klaus Peter, 4,043,937, Cl. 252-407.000.

Berg, Robert O., to Honeywell Inc. Block oriented random access memory. 4,044,339, Cl. 340-173.00R.

Bergmann, Henry F.; and Oswald, Bernard J., to AMT Corporation. Vehicle wheel assembly for a toy vehicle. 4,043,603, Cl. 301-63.0PW.

Berkowitz, Murray, to Curtiss-Wright Corporation. Seal grid assembly for rotary piston mechanism. 4,043,714, Cl. 418-123.000.

Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, to American Cyanamid Company. Derivatives of 9-oxo-13-trans-prostenoic acid esters. 4,044,043, Cl. 260-468.00D.

Bernard, Jean Rene; Brunel, Daniel Elie; Commeyras, Auguste Andre; Coste, Camille Michel; Itier, Jean Joseph; and Knoche, Hubert Wilhelm, to Societe Nationale Elf Aquitaine. Catalytic composition for the isomerization and alkylation of hydrocarbons. 4,044,069, Cl. 260-683.470.

Bernett, Frank E., to Tile Council of America, Inc. Sag-resistant dry-set mortar composition. 4,043,827, Cl. 106-92.000.

Berreman, Dwight Winton, to Bell Telephone Laboratories, Incorporated. Liquid crystal twist cell with grey scale capabilities. 4,043,640, Cl. 350-160.0LC.

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Bertrand, Jerome C.: *See—*
White, John F.; and Bertrand, Jerome C., 4,043,941, Cl. 252-430.000.

Besenfelder, Edward R.; and Gooding, Jack L., to Honeywell Information Systems, Inc. Variable cyclic redundancy character detector. 4,044,329, Cl. 340-146.10F.

Besozzi, Alfio J.; and Foster, Alan W., to Petro-Tex Chemical Corporation. Purification of unsaturated compounds. 4,044,067, Cl. 260-680.00E.

Bettonica, Luigi. Hydraulic press for the production of tiles, dishes, cups of ceramic material and the like. 4,043,730, Cl. 425-352.000.

Bevilacqua, Frank, to Combustion Engineering, Inc. Fissionable mass storage device. 4,044,267, Cl. 250-518.000.

Bianchi, Valerio; Schmidt, Peter; and Latsch, Reinhard, to Robert Bosch GmbH. Method and apparatus for controlling the operation of an internal combustion engine. 4,044,236, Cl. 235-150.210.

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Bieri, Hans. Jig saw blade with cooling channel. 4,043,311, Cl. 125-18.000.

Bierker, George John; and Kivnick, Arnold, to Pennwalt Corporation. Photochemical reactor and irradiation process. 4,043,886, Cl. 204-157.10R.

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Bigliani, Antonio: *See—*
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Moore, Charles E., Jr.; Crane, Sammy L.; and Lipke, Donald L., 4,044,249, Cl. 250-213.0VT.

Birchler, Robert O.; and Williams, E. R., Jr., to Texas Instruments Incorporated. Process for encapsulating electronic components in plastic. 4,043,027, Cl. 29-588.000.

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McDowell, David E.; and Yonkers, Robert A., 4,042,997, Cl. 15-366.000.

Bjorklund, James Axel Christer; and Ekengren, Turid, to Kemanord Aktiebolag. Process for sizing cellulose fibers with sulfamoylchlorides. 4,043,863, Cl. 162-158.000.

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Charm, Stanley E.; and Blair, Henry E., 4,043,759, Cl. 23-230.600.

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Blazek, William S., to TRW Inc. Method of making a mold. 4,043,379, Cl. 164-23.000.

Bleeker, Raymond A., to Westinghouse Electric Corporation. Cam secured support panel. 4,043,625, Cl. 312-351.000.

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Blocksom, David C.: *See*—
Morgan, Clyde R.; and Blocksom, David C., 4,042,974, Cl. 2-9.000.

Bloomfield, Jordan J.; and Owsley, Dennis C., to Monsanto Company. Aroma chemicals. 4,044,057, Cl. 260-617.00F.

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Blough, Ronald S.; Cook, Virgil W.; and Spates, Charles D., to American Chain & Cable Company, Inc. Textile cleaning. 4,042,998, Cl. 15-312.00A.

Blucher, Richard L.: *See*—
Bowser, George C., Jr.; and Blucher, Richard L., 4,044,192, Cl. 429-112.000.

Blumberg, Nathan: *See*—
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Bobeczko, Michael S., to Kaiser Aluminum & Chemical Corporation. Cup accumulator assembly. 4,043,444, Cl. 198-557.000.

Bochan, John, to General Electric Company. Liquid flow mechanical diverter valve. 4,043,158, Cl. 68-17.00R.

Boehner, Beat; Dawes, Dag; and Meyer, Willy, to Ciba-Geigy Corporation. Triazolylphosphorus compounds. 4,044,124, Cl. 424-200.000.

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Bost, Howard W., to Phillips Petroleum Company. Flame-resistant polyolefin compositions. 4,043,975, Cl. 260-45.75W.

Bourg, Guillaume; Christ, Hubertus; Hausmann, Taddaus; and Sales, Louis, to Daimler-Benz Aktiengesellschaft. Brake force control device for back-control. 4,043,608, Cl. 303-104.000.

Bowerman, Edwin R., to GTE Laboratories Incorporated. Video target locator. 4,044,377, Cl. 358-107.000.

Bowser, George C., Jr.; and Blucher, Richard L., to Catalyst Research Corporation. Thermal batteries. 4,044,192, Cl. 429-112.000.

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Hafer, Paul R., 4,043,586, Cl. 296-84.00C.

Bracco Industria Chimica Societa per Azioni: *See*—
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Brannen, H. David, to DB Electronics, Inc. Radio-antenna wall plate assembly. 4,043,629, Cl. 339-126.00J.

Braschler, Steve A., to Parmac, Inc. Mechanically adjustable dual pocket hydromatic brake. 4,043,434, Cl. 188-296.000.

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Modesto, Narciso G.; and Brejcha, Robert J., 4,043,738, Cl. 425-456.000.

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Brennan, Michael E.; Moss, Philip H.; and Yeakey, Ernest L., to Texaco Development Corporation. Preparation of polyalkylene polyamines. 4,044,053, Cl. 260-583.00P.

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Bendler, Hellmut; and Bretfeld, Anton, 4,043,128, Cl. 60-636.000.

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Brookman, Anthony Haldane Ray, to Rast Patent Manufacturers Pty. Ltd. Branch tool. 4,043,164, Cl. 72-332.000.

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Brown Boveri-Sulzer Turbomaschinen AG: *See*—
Hoffeins, Hans, 4,043,120, Cl. 60-39.140.

Brown, Delmont D., to D. S. Brown Company, The. Bridge joint seals. 4,043,693, Cl. 404-64.000.

Brown, Douglas S., to D & J Tool & Die, Inc. Drain trap and cover construction. 4,043,354, Cl. 137-247.330.

Brown, James D.: *See*—
Spencer, William H.; Dorius, John O.; and Brown, James D., 4,043,689, Cl. 403-252.000.

Brown, Robert O.; and Becker, Albert E., to Westinghouse Electric Corporation. Turbine generator cycle for provision of heat to an external heat load. 4,043,130, Cl. 60-655.000.

Brown, Samuel J.; DuRocher, Gideon A.; and McClure, Gerald L., to Essex Group, Inc. Electromagnetic solenoid relay assembly and electrical connection means therefor. 4,044,322, Cl. 335-131.000.

Brown, Timothy John, to In. Da. Te. Aktiengesellschaft. Re-usable containers. 4,043,482, Cl. 220-307.000.

Brown, Tony Ray; and Neresian, Leonard Sarkis, to American Hospital Supply Corporation. Self righting syringe protector. 4,043,334, Cl. 128-215.000.

Brown, Wilbur P., Jr., to Hughes Aircraft Company. Polarization reference imaging technique. 4,044,247, Cl. 250-199.000.

Browne, William R. K., to York Engineering, Inc. Wire rope termination. 4,043,690, Cl. 403-268.000.

BRS, Inc.: *See*—
Hollister, Geoffrey L.; and Vixie, Dennis E., 4,043,058, Cl. 36-102.000.

Bruck, Howard P.: *See*—
Godin, Victor B.; and Bruck, Howard P., 4,043,234, Cl. 83-40.000.

Brundler, Hans Josef. Machine for comminuting and mixing materials. 4,043,515, Cl. 241-97.000.

Brunel, Daniel Elie: *See*—
Bernard, Jean Rene; Brunel, Daniel Elie; Commeyras, Auguste Andre; Coste, Camille Michel; Itier, Jean Joseph; and Knoche, Hubert Wilhelm, 4,044,069, Cl. 260-683.470.

Bryars, David J. J., to Austen Bryars of London, Inc. Inlay wheel and method. 4,043,152, Cl. 66-9.00R.

Bryceland, Maurice Cyril, to Waldman Corporation. Push button assembly and electronic watch including the same. 4,043,115, Cl. 58-50.00R.

Buchberger, Gerhard: *See*—
Kostrzewa, Michael; Holst, Arno; and Buchberger, Gerhard, 4,044,198, Cl. 536-86.000.

Bucher, David Hoffer: *See*—
Sorlie, Donald Thomas; and Bucher, David Hoffer, 4,043,281, Cl. 111-85.000.
Sorlie, Donald Thomas; Bucher, David Hoffer; and Sutherland, Gail Russell, 4,043,404, Cl. 172-555.000.

Buckman, Thomas P. Combination vent and shut off valve. 4,043,489, Cl. 222-397.000.

Budrose, Charles R., to Upaya, Inc. Hand guided tape player. 4,044,393, Cl. 360-117.000.

Bugg, Kenly C. Wood treating process. 4,044,172, Cl. 427-55.000.

Buhrke Industries, Inc.: *See*—
Gorgius, Otto; and Quaas, Dietmar G., 4,043,169, Cl. 72-349.000.

Bulman, Melvin John; and Graham, Alfred Rapp, to General Electric Company. Liquid propellant gun (recoilless regenerative piston). 4,043,248, Cl. 89-1.703.

Bulten, Eric J.; and Verbeek, Francois, to Commer S.r.l. Method for the preparation of alkyl tin halides. 4,044,035, Cl. 260-429.700.

Bunker, James W., to Hi-Shear Corporation. Knee joint coupling. 4,043,000, Cl. 16-128.00R.

Bunker Ramo Corporation: *See*—
Ayer, George Edward, 4,043,627, Cl. 339-75.00R.
Taylor, Derek, 4,044,327, Cl. 338-166.000.

Bunn, Stuart E.; and Owsley, Herbert B. Compressor unloader assembly. 4,043,710, Cl. 417-440.000.

Bunz, Peter: *See*—
Scharbach, Heinz; Engelhardt, Achim; and Bunz, Peter, 4,044,170, Cl. 427-2.000.

Burkwall, Morris P., Jr., to Quaker Oats Company, The. Caseinate replacement for pet food using a neutral chelating agent. 4,044,158, Cl. 426-271.000.

Burlington AG: *See*—
Schmidt, Walter Richard, 4,043,151, Cl. 66-9.00R.

Burmah Oil and Gas Company: *See*—
Bascope, Alberto H.; and Grizzard, Eugene H., 4,043,912, Cl. 210-83.000.

Burroughs Corporation: *See*—
Gibbs, Stephen R., 4,043,894, Cl. 204-297.00W.
Przybylek, George John; and Lesky, Joseph, 4,044,275, Cl. 313-177.000.

Burroughs Wellcome Co.: *See*—
Mehta, Nariman Bomanshaw; and Brieaddy, Lawrence Edward, 4,044,014, Cl. 260-293.730.

Burton, Gardner T.: *See*—
Croce, Richard F.; and Burton, Gardner T., 4,043,653, Cl. 355-2.000.

Busby, Edwin S., Jr.: *See*—
Oldershaw, Reginald W.; and Busby, Edwin S., Jr., 4,044,389, Cl. 360-73.000.

Busch, Richard E., to Addmaster Corporation. Paper feed and web rewind mechanism. 4,043,440, Cl. 197-114.00R.

Bush, Bill R.; and Hornstein, Jack, to Preload Company, Inc. Overlap closure system for precast prestressed water tanks. 4,043,089, Cl. 52-516.000.

Butler, James L., to American Bath and Shower Corporation. Automatic bathtub water level control system. 4,042,984, Cl. 4-200.000.

Butter, Stephen A.; and Kaeding, Warren W., to Mobile Oil Corporation. Conversion utilizing a phosphorus-containing zeolite catalyst. 4,044,065, Cl. 260-677.00R.

Buuck, Dennis L., to Fairfield Manufacturing Company, Inc. Disengage mechanism for gear drive. 4,043,226, Cl. 74-801.000.

Buus, Jorn Lasse Martin; Lassen, Niels; and Bigler, Allan Johan, to Kefalas A/S. Thiaxanthene derivatives. 4,044,024, Cl. 260-328.000.

Buysch, Hans-Josef; and Heuser, Jurgen, to Bayer Aktiengesellschaft. Process for the preparation of α,α,α',α'-tetramethylphenylene biscarbinols. 4,044,058, Cl. 260-618.00C.

Buysch, Hans-Josef; and Scholz, Karl-Heinz, to Bayer Aktiengesellschaft. Process for preparing geminal dihalides. 4,044,060, Cl. 260-651.00R.

BWG Bergwerk- und Walzwerk-Maschinenbau G.m.b.H.: *See*—
Noe, Oskar; and Skrober, Wolfgang, 4,043,162, Cl. 72-163.000.

Byk Gulden Lomberg Chemische Fabrik GmbH: *See*—
Kramann, Bernhard; and Tammen, Heinrich, 4,043,345, Cl. 128-349.00R.

Byrne, Michael F.; and Powelson, Douglas V. N., to Allied Chemical Corporation. Method of joining plastic pipe. 4,043,857, Cl. 156-198.000.

C. F. Spiess & Sohn: *See*—
Perkow, Werner; Hopp, Hans; and Ingwersen, Walter, 4,044,045, Cl. 260-470.000.

C. van der Lely N. V.: *See*—
van der Lely, Cornelis; and van der Lely, Ary, 4,043,400, Cl. 172-43.000.

Cabell, Douglas N., to GF Business Equipment, Inc. Adjustable chair rest member. 4,043,594, Cl. 297-353.000.

Cabot Corporation: *See*—
Acuncius, Dennis A.; Herchenroeder, Robert B.; Kirchner, Russell W.; and Silence, William L., 4,043,810, Cl. 75-171.000.

Cain, Earl S.; Carlson, Jerome A.; and Goodrich, George E., to Tribotech. Self-aligning bearing and rod end assembly including formed ball mount. 4,043,617, Cl. 308-72.000.

Caldwell, John R., to Xerox Corporation. Copier document handler. 4,043,665, Cl. 355-76.000.

Calgon Corporation: *See*—
Noren, Gerry Karl, 4,044,054, Cl. 260-584.00A.

California Institute of Technology: *See*—
Goetz, Alexander F. H.; Graham, Richard A.; and Ozawa, Tetsuo, 4,043,668, Cl. 356-73.000.

Cambridge Thermionic Corporation: *See*—
Lyman, Frank, 4,043,614, Cl. 308-10.000.

Camelio, Joseph Robert. Ski carrying device and method. 4,043,493, Cl. 224-45.00S.

Cameron Iron Works, Inc.: *See*—
Weldon, James M., 4,043,391, Cl. 166-217.000.

Campbell, Alfred: *See*—
Tinney, Francis John; Nicolaides, Ernest D.; and Campbell, Alfred, 4,043,993, Cl. 260-112.5LH.

Campbell, Douglas C. Plugging of abandoned dry wells. 4,043,394, Cl. 166-253.000.

Campbell, Norman: *See*—
Dix, Joseph; Campbell, Norman; and Torseth, Ivar S., Jr., 4,043,499, Cl. 228-173.000.

Canon Kabushiki Kaisha: *See*—
Hirose, Ryusho; and Tsuji, Takao, 4,043,642, Cl. 350-184.000.
Inoue, Shozo; and Sato, Tadashi, 4,043,658, Cl. 355-10.000.
Kishimoto, Jyuji; and Toyomura, Shigeru, 4,044,228, Cl. 235-61.90A.

Carl Zeiss Stiftung: *See*—
Holzinger, Otto; and Pross, Wilhelm, 4,043,676, Cl. 356-226.000.

Carlomagno, Giovanni Maria; and Costa, Bruno, to Italsider S.p.A. Method and device for blowing oxygen in metal refining converters in unstationary manner. 4,043,799, Cl. 75-60.000.

Carlson, Arthur, Jr.; and Rupe, Billy D., to Cutter Laboratories, Inc. Method of controlling release of medicament and bolus therefor. 4,044,119, Cl. 424-22.000.

Carlson, Jerome A.: *See*—
Cain, Earl S.; Carlson, Jerome A.; and Goodrich, George E., 4,043,617, Cl. 308-72.000.

Carlson, Robert G., to General Electric Company. Impact resistant composite article comprising laminated layers of collimated filaments in a matrix wherein layer-layer bond strength is greater than collimated filament-matrix bond strength. 4,043,703, Cl. 416-230.000.

Carpentier, John H., to Beatrice Foods Co. Drain assembly for sinks and the like. 4,042,983, Cl. 4-291.000.

Carr, David L., to Eastman Kodak Company. Ultrasonically smoothing a magnetic layer on a web. 4,044,174, Cl. 427-130.000.

Casey, Robert, to Caterpillar Tractor Co. Rim construction and tool apparatus for safe tire inflation. 4,043,375, Cl. 157-1.000.

Casey, T. Eisert: *See*—
O'Sullivan, Denis J.; Bolger, Bernard J.; and Casey, T. Eisert, 4,043,982, Cl. 260-47.0UA.

Caspel Industries: *See*—
DiMatteo, Frank J., 4,043,329, Cl. 128-132.00R.

Cassella Farbwerke Mainkur Aktiengesellschaft: *See*—
Keil, Karl-Heinz; Keller, Karlfried; Ribka, Joachim; and Tichy, Dieter, 4,043,984, Cl. 260-67.60R.

Castillo, Adolfo: *See*—
Jureit, John Calvin; and Castillo, Adolfo, 4,044,093, Cl. 269-321.00F.

Castro, Manuel A. Stack loader for bales. 4,043,461, Cl. 214-6.00B.

Catalyst Research Corporation: *See*—
Bowser, George C., Jr.; and Blucher, Richard L., 4,044,192, Cl. 429-112.000.

Caterpillar Tractor Co.: *See*—
Beals, Charles E.; Chambers, Robert O.; Hanson, Edwin E.; and Satzler, Ronald L., 4,043,227, Cl. 74-868.000.
Casey, Robert, 4,043,375, Cl. 157-1.000.
Grawey, Charles E., 4,044,085, Cl. 264-90.000.
Kolb, David L., 4,043,220, Cl. 74-543.000.
Smith, Duane R., 4,043,374, Cl. 152-405.000.
Stepe, Visvaldis A., 4,043,060, Cl. 37-141.00R.
Unwin, William B.; Groezinger, John J.; and Grawey, Charles E., 4,043,370, Cl. 152-354.000.

Cathles, Lawrence MacLagan, III: *See*—
Lingane, Peter James; Cathles, Lawrence MacLagan, III; and Hsueh, Limin, 4,043,599, Cl. 299-4.000.

Catt, John D.: *See*—
Comer, William T.; and Catt, John D., 4,044,151, Cl. 424-321.000.

Cavicchio, Raymond A. Circuit for musical instrument. 4,043,242, Cl. 84-1.170.

Cawood, Charles D., Jr.; and Ziegler, John S., to American Hospital Supply Corporation. Urological drape. 4,043,328, Cl. 128-132.00D.

Celotex Corporation, The: *See*—
Jones, William R., 4,043,719, Cl. 425-115.000.

Center for Design Research and Development N.V.: *See*—
Ambasz, Emilio, 4,043,063, Cl. 40-119.000.

Central Glass Company, Limited: *See*—
Enomoto, Takamitsu; Ogura, Motoshige; and Ono, Tetsuhiro, 4,044,105, Cl. 423-308.000.

Cepuritis, Talivaldis, to Johnson & Johnson. Diaper with repositionable tab fastener. 4,043,340, Cl. 128-287.000.

Cerkanowicz, Anthony E., to Photochem Industries, Inc. Control of the initiation of combustion and control of combustion. 4,043,308, Cl. 123-143.00R.

Cerruti, Roger Anthony; McWhorter, Thomas Ellsworth; and Ruprecht, David Russell, to Air Products and Chemicals, Inc. Combined flow measuring and valve leakage indicator. 4,043,355, Cl. 137-312.000.

Cervin, Curtis M. Poultry shackle scrubber. 4,042,993, Cl. 15-21.00D.

CF&I Engineers, Inc.: *See*—
Leibig, Wilhelm J.; Steele, Clarence R.; and Price, Frank B., 4,043,832, Cl. 127-6.000.

Chambers, Robert O.: *See*—
Beals, Charles E.; Chambers, Robert O.; Hanson, Edwin E.; and Satzler, Ronald L., 4,043,227, Cl. 74-868.000.

Champan, Louis W.; and Perkins, Arthur T., to Melco. Digital decoder for multiple frequency telephone signalling. 4,044,206, Cl. 179-84.0VF.

Chan, Wayne W.: *See*—
Roberts, Charles Grady; Chan, Wayne W.; and Collins, Dean R., 4,044,374, Cl. 357-80.000.

Chang, Clarence D.; Silvestri, Anthony J.; and Zahner, John C., to

Mobil Oil Corporation. Preheating methanol effects steady state operation of conversion to gasoline. 4,044,061, Cl. 260-668.00R.

Chang, Wen-Hsuan; Hartman, Marvis E.; and Scriven, Roger L., to PPG Industries, Inc. Ambient temperature, moisture-curable acrylic-silane coating compositions having improved potlife. 4,043,953, Cl. 260-18.00S.

Charles Stark Draper Laboratory, Inc., The: *See—*
Oberbeck, George A., 4,044,305, Cl. 324-154.00R.

Charm, Stanley E.; and Blair, Henry E. Method of determining methotrexate. 4,043,759, Cl. 23-230.600.

Chattoraj, Shib C.: *See—*
Eisentraut, Kent J.; and Chattoraj, Shib C., 4,044,116, Cl. 423-658.500.

Cheatum, Leo George, to Deere & Company. Agricultural implement hydraulic system. 4,043,099, Cl. 56-10.900.

Check, John M.; and Rupert, Gary F., to Raycon Corporation. Multiple electrode electrical discharge machining. 4,044,216, Cl. 219-69.00E.

Chelberg, Rodney. Drill attachment. 4,043,698, Cl. 408-201.000.

Chembond Corporation: *See—*
Robitschek, Paul; and Christensen, Ross L., 4,044,087, Cl. 264-113.000.

Cherian, Abraham, to Xerox Corporation. Transparency copying machine. 4,043,656, Cl. 355-3.00R.

Chernenko, Ivan Alexeevich: *See—*
Lebedev, Vladimir Konstantinovich; Chernenko, Ivan Alexeevich; Postolaty, Nikolai Ivanovich; Kuchuk-Yatsenko, Sergei Ivanovich; Tishura, Vladimir Ivanovich; Entin, Yakov Borisovich; Filippov, Alexandr Nikolaevich; and Martynov, Evgeny Petrovich, 4,044,219, Cl. 219-100.000.

Cherrington, Martin D., to Tidril Corporation. System and method for installing production casings. 4,043,136, Cl. 61-72.700.

Chervin, Andre. Finger ring with means for locking behind the knuckle. 4,043,145, Cl. 63-15.000.

Chevron Research Company: *See—*
Anderson, Robert G.; Straus, Alan E.; and Wilkes, John B., 4,044,027, Cl. 260-346.750.
DeVries, Louis, 4,044,039, Cl. 260-453.0RW.
Fredriksson, Oke A.; and Thomas, Elmer L., 4,043,175, Cl. 73-1.0DV.
Kurkov, Victor P., 4,044,050, Cl. 260-491.000.
Schneider, Ronald A., 4,043,943, Cl. 252-437.000.

Chicago Tool and Engineering Company: *See—*
Glomb, Frank A.; and Griffith, William S., 4,043,547, Cl. 269-136.000.

Chichin, Alexandr Vasilievich: *See—*
Romanenko, Nikolai Trofimovich; Chichin, Alexandr Vasilievich; Lyaskovsky, Ivan Frantsevich; Melnik, Vladimir Jurievich; Medinsky, Nikolai Ivanovich; and Yakunin, Valentin Matveevich, 4,043,211, Cl. 74-110.000.

Chihara, Hiroyuki, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece battery-potential detecting circuit. 4,043,110, Cl. 58-23.0BA.

Chodnikiewicz, Krzysztof: *See—*
Marciniak, Zdzislaw; Sklad, Mateusz; and Chodnikiewicz, Krzysztof, 4,043,173, Cl. 72-403.000.

Chou, Eddie C.: *See—*
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Christ, Hubertus: *See—*
Bourg, Guillaume; Christ, Hubertus; Hausmann, Taddaus; and Sales, Louis, 4,043,608, Cl. 303-104.000.

Christen, Roland W.: *See—*
Dhyanchand, P. John J.; Glennon, Timothy F.; and Christen, Roland W., 4,044,296, Cl. 322-25.000.

Christensen, Ross L.: *See—*
Robitschek, Paul; and Christensen, Ross L., 4,044,087, Cl. 264-113.000.

Christiansen, Arvid, to Miranol Chemical Company, Inc., The. Nitrogenous condensation products. 4,044,034, Cl. 260-404.500.

Christo, Christ, to Masco Corporation of Indiana. Water faucet. 4,043,359, Cl. 137-625.410.

Chromalloy American Corporation: *See—*
Anderson, Carl M.; and Anderson, Charles W., 4,043,403, Cl. 172-413.000.

Chu, Simon Long; Shu, Peter; and Sharowsky, Robert, to Polychrome Corporation. Roll construction for coating apparatus. 4,043,296, Cl. 118-419.000.

Churchward, Roy Alexander. Golf club. 4,043,563, Cl. 273-171.000.

Ciba-Geigy AG: *See—*
Baumann, Niklaus, 4,043,819, Cl. 96-115.00P.
Kitzing, Rainer; and Smith, Norman Alfred, 4,043,995, Cl. 260-117.000.
Koller, Stefan; Karlen, Urs; Kneubuhler, Werner; and Defago, Raymond, 4,044,029, Cl. 260-376.000.

Ciba-Geigy Corporation: *See—*
Abel, Heinz; Toepfl, Rosemarie; and Schibler, Luzius, 4,044,178, Cl. 427-373.000.
Boehner, Beat; Dawes, Dag; and Meyer, Willy, 4,044,124, Cl. 424-200.000.
Hari, Stefan; Irvine, Alexander McHugh; McCrae, James McGeachie; Vuitel, Laurent; and L'Eplattenier, Francois, 4,044,036, Cl. 260-438.100.
Howarth, Graham Arton; and Gainer, James, 4,044,130, Cl. 424-248.560.
Jager, Horst, 4,044,075, Cl. 260-943.000.
Model, Ernst; and Pugin, Andre, 4,043,999, Cl. 260-152.000.
Schmidt, Andreas; Peterson, Janet B.; and Dexter, Martin, 4,044,019, Cl. 548-313.000.
Seha, Zdenek, 4,044,030, Cl. 260-378.000.
Stark, Bernard Peter; and Thoseby, Michael Robert, 4,043,983, Cl. 260-65.000.

Cimarusti, Christopher M.: *See—*
Hauck, Frederic Peter; Reid, Joyce; Narayanan, Venkatachala L.; Cimarusti, Christopher M.; Haugwitz, Rudiger D.; and Sundeen, Joseph E., 4,044,040, Cl. 260-456.00P.

Cincinnati Milacron Inc.: *See—*
Wisbey, Jerry Dale, 4,043,486, Cl. 222-134.000.

Clampitt, Richard L.: *See—*
Hessert, James E.; and Clampitt, Richard L., 4,043,921, Cl. 252-8.50C.

Clarisse, Eddy Johan, to U.S. Philips Corporation. Frequency selector comprising a freewheel coupling. 4,043,207, Cl. 74-10.150.

Clark Equipment Company: *See—*
Albright, Larry E.; and Frederick, Dan A., 4,043,253, Cl. 92-25.000.
Albright, Larry E.; Bauer, James J.; and Cramton, Earl W., 4,043,416, Cl. 180-6.480.
Hansen, Howard C., 4,043,463, Cl. 214-16.40A.
Hoyt, Deryl R., 4,043,472, Cl. 214-750.000.

Clarke Chapman Limited: *See—*
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Jones, Emyr, 4,043,497, Cl. 228-2.000.

Claybaker, LeRoy A., to General Electric Company. Compositions and laminates made therefrom. 4,043,954, Cl. 260-19.00A.

Cline, Clinton: *See—*
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Cloud, James Zeno, Jr.: *See—*
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Coats & Clark, Inc.: *See—*
Jovin, Eudor Louis, 4,043,232, Cl. 83-13.000.

Cobb, A. Tom, to Continental Oil Company. Ram-shear and slip device for well pipe. 4,043,389, Cl. 166-55.000.

Cochran, Robert W. Electro-pneumatic fruit picker. 4,043,105, Cl. 56-328.00R.

Cochran, Stanley Robert; and Davis, Oren Hardin, to Du Pont de Nemours, E. I., and Company. Process and apparatus for producing thick and thin filaments. 4,044,089, Cl. 264-167.000.

Cockshott, Ian Derek: *See—*
Martin, Graham Ernest; and Cockshott, Ian Derek, 4,043,331, Cl. 128-156.000.

Cogas Development Co.: *See—*
Friedman, Louis D., 4,043,831, Cl. 106-288.00B.

Cognion, Jean-Marie, to Produits Chimiques Ugine Kuhlmann. Process for the preparation of 8-hydroxyquinoline. 4,044,011, Cl. 260-289.0XA.

Cohen, Elliott: *See—*
Hanifin, John William, Jr.; Gussin, Robert Zalmon; and Cohen, Elliott, 4,044,021, Cl. 548-312.000.

Coleman, Charles E.: *See—*
Hammel, Ronald O.; and Coleman, Charles E., 4,044,268, Cl. 307-66.000.

Colgate-Palmolive Company: *See—*
Dickson, Robert E., 4,043,965, Cl. 260-29.60F.

Collins, Dean R.: *See—*
Roberts, Charles Grady; Chan, Wayne W.; and Collins, Dean R., 4,044,374, Cl. 357-80.000.

Collins Machinery Corporation: *See—*
Elkin, Robert D., 4,043,016, Cl. 29-240.000.

Colombo, Paolo: *See—*
Ackermann, Jacob; Radici, Pierino; Santini, Umberto; and Colombo, Paolo, 4,043,873, Cl. 203-46.000.

Columbus McKinnon Corporation: *See—*
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Combustion Engineering, Inc.: *See—*
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Comer, William T.; and Catt, John D., to Mead Johnson & Company. Sulfamidophenethanolamine therapeutic process. 4,044,151, Cl. 424-321.000.

Cominco Ltd.: *See—*
Wyton, Wayne W.; and Doeksen, Gerard, 4,044,259, Cl. 250-360.000.

Commer S.r.l.: *See—*
Bulten, Eric J.; and Verbeek, Francois, 4,044,035, Cl. 260-429.700.

Commeyras, Auguste Andre: *See—*
Bernard, Jean Rene; Brunel, Daniel Elie; Commeyras, Auguste Andre; Coste, Camille Michel; Itier, Jean Joseph; and Knoche, Hubert Wilhelm, 4,044,069, Cl. 260-683.470.

Commissariat a l'Energie Atomique: *See—*
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Benque, Jean-Pierre; Lallement, Jean; and Lambert, Paul, 4,043,867, Cl. 176-40.000.

Commonwealth Scientific and Industrial Research Organization: *See—*
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Commterm Inc.: *See—*
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Compagnie des Etablissements Dela Risle: *See—*
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Compagnie Europeenne d'Accumulateurs: *See—*
Dupuis, Jean-Michel; and Lasserre, Pierre, 4,044,300, Cl. 324-29.500.
Compagnie Internationale de Minerallurgie - CIM: *See—*
Le Bras, Eugene, 4,043,821, Cl. 106-39.600.
Conair, Inc.: *See—*
Peterson, Russell I., Jr., 4,043,514, Cl. 241-36.000.
Condurso, Letterio Dominic. Fish and lure retriever. 4,043,072, Cl. 43-17.200.
Conn, Bartley Russell, to Irradiated Strings, Inc. Racquet string and method. 4,043,555, Cl. 273-73.00D.
Conn, Charles E., Jr., to TRE Corporation. Method of plastic flow diffusion bonding. 4,043,498, Cl. 228-265.000.
Connors, Frank T., to Symons Corporation. Method and means for supporting an elevated concrete wall panel form. 4,043,087, Cl. 52-127.000.
Consiglio Nazionale Delle Ricerche: *See—*
Migliaccio, Mariano; and Pisani, Emilio, 4,043,303, Cl. 123-119.00R.
Construction Products Research, Inc.: *See—*
Gaines, Robert W., 4,043,828, Cl. 106-97.000.
Consumer Publishing Company, Inc.: *See—*
Suarez, Richard A., 4,043,553, Cl. 272-128.000.
Container Corporation of America: *See—*
Kaulfuss, William P.; and Kaulfuss, Robert H., 4,043,086, Cl. 52-71.000.
Continental Can Company, Inc.: *See—*
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Continental Group, Inc., The: *See—*
Khoury, Nick S., 4,043,479, Cl. 220-271.000.
Continental Gummi-Werke Aktiengesellschaft: *See—*
Pakur, Henryk; and Tiemann, Reinhard, 4,043,371, Cl. 152-362.00R.
Schiron, Dieter, 4,043,462, Cl. 214-10.50R.
Continental Oil Company: *See—*
Cobb, A. Tom, 4,043,389, Cl. 166-55.000.
Every, Richard L.; and Dell'Osso, Luino, Jr., 4,043,395, Cl. 166-263.000.
Kegler, William H., 4,043,898, Cl. 208-50.000.
Contractor, Rashmikant Maganlal; and Hwang, Sang-Hak, to Du Pont de Nemours, E. I., and Company. Process for forming a staple fiber batt. 4,043,005, Cl. 19-155.000.
Contreras, Albert. Flush toilet water conservation valve assembly. 4,042,982, Cl. 4-67.00A.
Control Data Corporation: *See—*
Porter, James L., 4,044,376, Cl. 358-84.000.
Cook, Donald F.: *See—*
McHugh, Donald P.; and Cook, Donald F., 4,043,509, Cl. 239-265.410.
Cook, John Walter, to North American Philips Corporation. Toilet waste holding apparatus. 4,042,981, Cl. 4-10.000.
Cook, Peter Barry; and Hunt, John Harold, to Allen & Hanburys Limited. Steroidal aerosol compositions and process for the preparation thereof. 4,044,126, Cl. 424-243.000.
Cook, Virgil W.: *See—*
Blough, Ronald S.; Cook, Virgil W.; and Spates, Charles D., 4,042,998, Cl. 15-312.00A.
Cooke, Victor F. G.; and Thorpe, Donald H., to Hooker Chemicals & Plastics Corporation. Low profile polyester molding composition. 4,043,988, Cl. 260-862.000.
Cooksey, James Judson: *See—*
Weiss, William Robert; Cooksey, James Judson; and Mullins, Phillip Leroy, 4,043,008, Cl. 28-271.000.
Cooper, Leon N.; and Elbaum, Charles, to Nestor Associates. Information processing system. 4,044,243, Cl. 235-152.000.
Cooper, Nathan E. Solar heat collector. 4,043,315, Cl. 126-270.000.
Coors, George Thom., to Leder, Inc. Coil compressed plunger cavity components for a wet type solenoid. 4,044,324, Cl. 335-260.000.
Copal Company Limited: *See—*
Inoue, Nobuyoshi, 4,044,368, Cl. 354-267.000.
Copelin, Harry Bugbird, to Du Pont de Nemours, E. I., and Company. One-step method for hydrolyzing and hydrogenating acetal-aldehydes. 4,044,059, Cl. 260-635.00A.
Corco, Inc.: *See—*
Croley, Thomas E., 4,043,502, Cl. 229-17.00B.
Corning Glass Works: *See—*
DeMunn, Clark V.; Kerko, David J.; Westwig, Ralph A.; and Wrisley, David B., Jr., 4,043,781, Cl. 65-30.00R.
Rogers, Charles H.; and Sullivan, Kevin J., 4,043,292, Cl. 118-5.000.
Costa, Armando, to Ing. C. Olivetti & C., S.p.A. Perforated tape reader. 4,044,230, Cl. 235-61.11C.
Costa, Bruno: *See—*
Carlomagno, Giovanni Maria; and Costa, Bruno, 4,043,799, Cl. 75-60.000.
Costa, Charles R.; and Smigel, Robert L., to Loctite Corporation. Dispensing and wiping device. 4,043,683, Cl. 401-264.000.
Coste, Camille Michel: *See—*
Bernard, Jean Rene; Brunel, Daniel Elie; Commeyras, Auguste Andre; Coste, Camille Michel; Itier, Jean Joseph; and Knoche, Hubert Wilhelm, 4,044,069, Cl. 260-683.470.
Cosyns, Jean: *See—*
Juguin, Bernard; Cosyns, Jean; Le Page, Jean-Francois; and Miquel, Jean, 4,043,944, Cl. 252-441.000.
Courtenay, John Henry; and Wardell, Martin Bernard Peter, to Foseco Trading A.G. Tundish with weirs. 4,043,543, Cl. 266-275.000.
Courty, Philippe: *See—*
Dezael, Claude; Franckowiak, Sigismond; Courty, Philippe; and Gruhier, Henri, 4,044,114, Cl. 423-574.00R.
Cowgill, Paul N.; and Pearson, John L., to United States of America, Army. Missile maneuver concept. 4,044,237, Cl. 235-150.270.
Cowley, John M., to Atwood & Morrill Co. Auxiliary closing force for valves. 4,043,533, Cl. 251-57.000.
Cox, Jerome P., Jr.; and Gerth, Vernon W., Jr., to Picker Corporation. Tomography system having an ultra high speed processing unit. 4,044,240, Cl. 235-151.300.
Coxon, J. Barton; and Ling, Kenneth R., to Ford Motor Company. Method of recycling powder coatings in a plural coating operation. 4,044,175, Cl. 427-195.000.
Cragoe, Edward J., Jr.: *See—*
Schultz, Everett M.; and Cragoe, Edward J., Jr., 4,044,153, Cl. 424-330.000.
Craig, John William Thomas: *See—*
Moss, Gerald; Johnes, Graham Lloyd; and Craig, John William Thomas, 4,043,741, Cl. 431-3.000.
Crain, Auther Lee. Kneeling apparatus for cement masons. 4,043,424, Cl. 182-230.000.
Cram, Donald J., to University of California, The Regents of the. Polymer-multiheteromacrocycles. 4,043,979, Cl. 260-47.0UP.
Cramton, Earl W.: *See—*
Albright, Larry E.; Bauer, James J.; and Cramton, Earl W., 4,043,416, Cl. 180-6.480.
Crane Packing Company: *See—*
Henzl, Jerry, 4,043,727, Cl. 425-578.000.
Crane, Robert L., to United States of America, Air Force. Non-destructive inspection of composite and adhesively bonded structures. 4,044,253, Cl. 250-302.000.
Crane, Sammy L.: *See—*
Moore, Charles E., Jr.; Crane, Sammy L.; and Lipke, Donald L., 4,044,249, Cl. 250-213.0VT.
Cremer, Joseph; Joerchel, Egon; and Harnisch, Heinz, to Hoechst Aktiengesellschaft. Production of phosphorus nitrides. 4,044,104, Cl. 423-302.000.
Cresswell, Michael W.; and Roberts, John S., to Westinghouse Electric Corporation. Low forward voltage drop thyristor. 4,043,837, Cl. 148-1.500.
Crisler, John E.: *See—*
Andres, Philip J., IV; Crisler, John E.; and Kalmich, Sol I., 4,043,736, Cl. 425-397.000.
Croce, Richard F.; and Burton, Gardner T., to United States of America, Air Force. Holographic high resolution contact printer. 4,043,653, Cl. 355-2.000.
Croley, Thomas E., to Corco, Inc. Packing, shipping, and side-dispensing container for dense material. 4,043,502, Cl. 229-17.00B.
Cromer, Charles F.; and Freeman, Willie B., to Westinghouse Electric Corporation. Puffer-type compressed-gas circuit-interrupter. 4,044,211, Cl. 200-148.00A.
Cross, Barrington; and Walworth, Bryant Leonidas, to American Cyanamid Company. 1,2-Dialkylpyrazolium compounds having 3-(or 3,5-) nitrogen-containing heterocyclic group. 4,044,013, Cl. 260-293.630.
Crossley, Roger: *See—*
Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, 4,044,138, Cl. 424-258.000.
Crowder, Norman A., to Sargent-Welch Scientific Company. Teaching machine. 4,043,054, Cl. 35-9.00A.
Crumbaugh, John H.: *See—*
Paul, George W.; Balinski, Henry A.; Quigg, Paul S.; and Crumbaugh, John H., 4,043,092, Cl. 52-712.000.
CTS Corporation: *See—*
Newell, Darrell E.; Jennings, John F.; Fritsch, Steven Lyle; and Hinnah, Howard D., 4,044,317, Cl. 331-116.00R.
Cunard Steam-Ship Company Limited, The: *See—*
Mullarkey, William Joseph, 4,044,205, Cl. 179-1.00P.
Cunnell, Michael Derek, to Lucas Electrical Limited. Fluid pressure transducer. 4,043,201, Cl. 73-398.0AR.
Cunningham, Sinclair Upton, to National Research Development Corporation. Cam follower piston. 4,043,255, Cl. 92-158.000.
Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, to John Wyeth & Brother Limited. Pharmaceutical compositions containing 5,6,7,8-tetrahydroquinoline derivatives and related compounds. 4,044,138, Cl. 424-258.000.
Curry, Paul F. Shuttle car with operator protection. 4,043,588, Cl. 296-102.000.
Curtis, Richard E.; Dench, Robert H.; and Dervin, Victor J., to N.P.I. Corporation. Air handler. 4,044,078, Cl. 261-30.000.
Curtiss-Wright Corporation: *See—*
Berkowitz, Murray, 4,043,714, Cl. 418-123.000.
Cutler, Charles W.: *See—*
Adams, James S.; and Cutler, Charles W., 4,044,286, Cl. 318-297.000.
Cutter Laboratories, Inc.: *See—*
Carlson, Arthur, Jr.; and Rupe, Billy D., 4,044,119, Cl. 424-22.000.
Schroeder, Duane D., 4,043,997, Cl. 260-122.000.
Cycles Peugeot: *See—*
Lacroix, Bernard, 4,043,684, Cl. 403-8.000.
Czombos, Jozsef: *See—*
Karpati, Egon; Szporny, Laszlo; Bartok, Mihaly; Czombos, Jozsef; Felfoldi, Karoly; Laszlavik, Marta; and Notheisz, Ferenc, 4,044,146, Cl. 424-283.000.
Czuba, Leonard J.: *See—*
Althuis, Thomas H.; Czuba, Leonard J.; Hess, Hans-Jurgen E.; and Kadin, Saul B., 4,044,134, Cl. 424-251.000.

D & J Tool & Die, Inc.: *See*—
Brown, Douglas S., 4,043,354, Cl. 137-247.330.

D. S. Brown Company, The: *See*—
Brown, Delmont D., 4,043,693, Cl. 404-64.000.

Dahl, Robert M. Sorting table arrangement. 4,043,276, Cl. 108-28.000.

Dahlgren, Lennart, to Hasselblad, Fritz Victor. Roller blind shutter for cameras. 4,044,367, Cl. 354-242.000.

Dahms, Ronald H., to Monsanto Company. Resole resin binder composition. 4,043,970, Cl. 260-29.300.

Dai Nippon Toryo Co., Ltd.: *See*—
Nakamura, Kenji; Jinnai, Toshio; Totani, Kazuo; and Furuta, Shigetaro, 4,043,634, Cl. 350-160.0LC.

Daimler-Benz Aktiengesellschaft: *See*—
Bourg, Guillaume; Christ, Hubertus; Hausmann, Taddaus; and Sales, Louis, 4,043,608, Cl. 303-104.000.

Dallas County Association for the Blind: *See*—
Ballew, Audrey H., 4,043,602, Cl. 300-16.000.

Daly, Dante, to Ing. C. Olivetti & C., S.p.A. Serial printing device for typewriters, accounting machines, teleprinters and similar office machines. 4,043,439, Cl. 197-18.000.

Daly, Edward J.; Sparks, Richard; and Spencer, George R., to Raytheon Company. Ganged radio frequency filter. 4,044,318, Cl. 333-1.000.

Damon, Lloyd E.: *See*—
Sperry, Philip R.; Setzer, William C.; and Damon, Lloyd E., 4,043,840, Cl. 148-32.000.

Danfysik A/S: *See*—
Jespersen, Einar; and Skilbreid, Ottar Asbjorn, 4,044,266, Cl. 250-441.000.

Danguillier, Wilhelm: *See*—
Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, 4,043,766, Cl. 48-73.000.

Daniels, Peter J. L.; and Turner, William N., to Schering Corporation. 6'-N-alkyl-4,6-di-O-(aminoglycosyl)-1,3-diaminocyclitols, methods for their use as antibacterial agents and compositions useful therefor. 4,044,123, Cl. 424-180.000.

Danilewicz, John Christopher; Kemp, John Edward Glyn; and Wright, James Robert, to Pfizer Inc. Aminoquinazoline therapeutic agents. 4,044,136, Cl. 424-251.000.

Dantowitz, Edward, to Albany Novelty Mfg. Co. Plastic name tag holder. 4,043,858, Cl. 156-251.000.

Darrow, John O. G., to Westinghouse Air Brake Company. Fail-safe electronic time delay circuit. 4,044,272, Cl. 307-293.000.

Dart Industries Inc.: *See*—
Montesi, Edward N., 4,043,203, Cl. 73-427.000.

Data General Corporation: *See*—
Jeffery, Edwin A.; and Hinlein, Sigmund, 4,043,632, Cl. 350-7.000.

D'Atre, John Douglas: *See*—
Plunkett, Allan Barr; and D'Atre, John Douglas, 4,044,284, Cl. 318-227.000.
Plunkett, Allan Barr; and D'Atre, John Douglas, 4,044,285, Cl. 318-227.000.

Daughton, James M.: *See*—
Abdelrahman, Mona M.; and Daughton, James M., 4,044,371, Cl. 357-28.000.

David Brown Tractors Limited: *See*—
Ashfield, Herbert Edward; and Horsfall, Harry, 4,043,546, Cl. 267-162.000.

Davies, David S.: *See*—
Barner, Herbert E.; Davies, David S.; and Szabo, Lester J., 4,044,094, Cl. 423-32.000.

Davis, John Maxwell; and Lanoux, Sigred Boyd, to Du Pont de Nemours, E. I., and Company. Process for stabilizing polyamides. 4,043,974, Cl. 260-45.75C.

Davis, Oren Hardin: *See*—
Cochran, Stanley Robert; and Davis, Oren Hardin, 4,044,089, Cl. 264-167.000.

Davis, Robert: *See*—
Konucik, George J.; Robertson, Thomas B.; and Davis, Robert, 4,043,067, Cl. 43-6.000.

Davy Powergas, Inc.: *See*—
Houghtaling, Samuel V., 4,044,107, Cl. 423-320.000.

Dawes, Dag: *See*—
Boehner, Beat; Dawes, Dag; and Meyer, Willy, 4,044,124, Cl. 424-200.000.

Day, Arnold: *See*—
Hartjens, Hermen; and Day, Arnold, 4,043,902, Cl. 209-166.000.

DB Electronics, Inc.: *See*—
Brannen, H. David, 4,043,629, Cl. 339-126.00J.

DeCeglie, Gaetano J.: *See*—
Jolly, Michael D.; Nacci, Anthony T.; DeCeglie, Gaetano J.; and Vitti, Rudolf A., 4,044,167, Cl. 426-594.000.

"December 4" Drotmuvek: *See*—
Erodi, Gyorgy; Gorondi, Istvan; Kovacs, Laszlo; and Takacs, Gyorgy, 4,043,170, Cl. 72-364.000.

Deere & Company: *See*—
Cheatum, Leo George, 4,043,099, Cl. 56-10.900.
Sorlie, Donald Thomas; and Bucher, David Hoffer, 4,043,281, Cl. 111-85.000.
Sorlie, Donald Thomas; Bucher, David Hoffer; and Sutherland, Gail Russell, 4,043,404, Cl. 172-555.000.

Deering, Roland F., to Union Oil Company of California. Oil shale retorting. 4,043,897, Cl. 208-11.00R.

Deese, Raymond E. Coin display. 4,043,477, Cl. 220-23.400.

Defago, Raymond: *See*—
Koller, Stefan; Karlen, Urs; Kneubuhler, Werner; and Defago, Raymond, 4,044,029, Cl. 260-376.000.

DeFusco, Ernest L., to General Motors Corporation. Shim nut and screw bolt assembly. 4,043,239, Cl. 85-1.00R.

de Jong, Arie, to Perswerk de Jong B.V. Device for transforming a single pressure force into separate pressure forces. 4,043,236, Cl. 83-137.000.

DeKock, Cornelis; and Breure, Floris Hendrik, to ITT Industries, Inc. Arrangement for adjusting the damping force of a shock absorber. 4,043,435, Cl. 188-319.000.

Dell'Osso, Luino, Jr.: *See*—
Every, Richard L.; and Dell'Osso, Luino, Jr., 4,043,395, Cl. 166-263.000.

De Mets, Albert, to Bison-werke Bahre & Greten GmbH & Co. KG. Endless belt guide arrangement for a continuously operating press. 4,043,733, Cl. 425-371.000.

deMontigny, Armand; Eichenhofer, Kurt-Wilhelm; Toepsch, Hans; and Schliebs, Reinhard, to Bayer Aktiengesellschaft. Non-stick polyorganosiloxane coating compositions. 4,043,977, Cl. 260-46.5UA.

Demoute, Jean-Pierre: *See*—
Hainsut, Daniel; Demoute, Jean-Pierre; and Teche, Andre, 4,043,796, Cl. 71-98.000.

DeMunn, Clark V.; Kerko, David J.; Westwig, Ralph A.; and Wrisley, David B., Jr., to Corning Glass Works. Method for making a brown photochromic glass. 4,043,781, Cl. 65-30.00R.

Dench, Robert H.: *See*—
Curtis, Richard E.; Dench, Robert H.; and Dervin, Victor J., 4,044,078, Cl. 261-30.000.

Dervin, Victor J.: *See*—
Curtis, Richard E.; Dench, Robert H.; and Dervin, Victor J., 4,044,078, Cl. 261-30.000.

Deschamps Laboratories, Inc.: *See*—
Zebuhr, William Henry, 4,043,388, Cl. 165-166.000.

Deschenes, Pierre A.: *See*—
Villeret, Michel; Stephenne, Hubert; and Deschenes, Pierre A., 4,044,306, Cl. 325-38.00B.

Design Mold Inc.: *See*—
Farrand, John M., 4,043,699, Cl. 408-201.000.

DeTray, Donald E. Dry lap polisher. 4,043,081, Cl. 51-129.000.

Deverell, Harry E., to Allegheny Ludlum Industries, Inc. Method of producing pitting resistant, hot-workable austenitic stainless steel. 4,043,838, Cl. 148-2.000.

DeVlieg Machine Company: *See*—
Ortlieb, Robert M., 4,043,229, Cl. 82-24.00A.

DeVries, Louis, to Chevron Research Company. HCN-olefin adduct using HF. 4,044,039, Cl. 260-453.0RW.

Dexter, Martin: *See*—
Schmidt, Andreas; Peterson, Janet B.; and Dexter, Martin, 4,044,019, Cl. 548-313.000.

Deyoe, Charles W.: *See*—
Hoseney, Russell C.; Seib, Paul A.; and Deyoe, Charles W., 4,044,154, Cl. 426-21.000.

Dezael, Claude; Franckowiak, Sigismond; Courty, Philippe; and Gruhier, Henri, to Institut Francais du Petrole. Process for purifying a gas containing sulfur compounds. 4,044,114, Cl. 423-574.00R.

Dhyanchand, P. John J.; Glennon, Timothy F.; and Christen, Roland W., to Sundstrand Corporation. Electronic voltage regulator for three-phase generators. 4,044,296, Cl. 322-25.000.

Dial, Darrell D.; and von Bose, Robert J., to Halliburton Company. Sealed cushioning unit. 4,043,545, Cl. 267-116.000.

Diamond Shamrock Corporation: *See*—
Olson, Richard O.; and Pohto, Gerald R., 4,044,218, Cl. 219-91.000.

Dianetti, Joseph C.: *See*—
Park, Ernest D.; and Dianetti, Joseph C., 4,043,633, Cl. 350-54.000.

Diax Corporation: *See*—
Kreuzer, Lloyd B., 4,044,257, Cl. 250-344.000.

di Carlo, Joseph Scotto: *See*—
Steinberg, Robert; and di Carlo, Joseph Scotto, 4,043,155, Cl. 66-132.00T.

Dickson, Robert E., to Colgate-Palmolive Company. Copolymer of acrylic acid and 1,1-dihydroperfluorooctyl methacrylate useful for applying non-permanent soil release finish. 4,043,965, Cl. 260-29.60F.

Die-Quip Corporation: *See*—
Maxwell, Thomas H., 4,043,080, Cl. 51-33.00W.

DIEHL: *See*—
Raab, Richard, 4,043,163, Cl. 72-255.000.

Diez de Aux, Alfonzo. Dental dowel pin setting apparatus. 4,043,040, Cl. 32-11.000.

DiMatteo, Frank J., to Caspel Industries, a part interest. Protective device. 4,043,329, Cl. 128-132.00R.

Diner, Uriel; and Elofson, Richard MacLeod, to Research Council of Alberta, The. Ruminant feed supplement and process for producing same. 4,044,156, Cl. 426-69.000.

Dionne, Norman J., to Raytheon Company. Carbon stabilized cobalt-rare earth magnetic materials. 4,043,845, Cl. 148-105.000.

Dix, Joseph; Campbell, Norman; and Tonseth, Ivar S., Jr., to General Electric Company. Method of making helical assembly. 4,043,499, Cl. 228-173.000.

Docimo, Peter J.; and Richey, Paul L., to Marvin Electric Manufacturing Company. Ceiling mounted light fixture. 4,044,246, Cl. 240-78.0CF.

Dr. C. Otto & Comp. G.m.b.H.: *See*—
Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, 4,043,766, Cl. 48-73.000.

Doeksen, Gerard: *See—*
Wyton, Wayne W.; and Doeksen, Gerard, 4,044,259, Cl. 250-360.000.

Dohgane, Iwao: *See—*
Suda, Hideaki; Dohgane, Iwao; and Hosaka, Hirokazu, 4,044,052, Cl. 260-96.50C.

Dole Refrigerating Company: *See—*
Klotz, Michael C.; and Mei, Viung C., 4,043,144, Cl. 62-277.000.

Dollase, Wolfhard: *See—*
Reif, Hans-Heinrich; Wehner, Klaus; Welker, Jurgen; Schmidt, Karl-Heinz; Schnick, Waltraud; Widmann, Lutz; Schicker, Otto; Seidel, Gunter; Kalb, Karsten; Dollase, Wolfhard; Furtig, Helmut; Hose, Werner; Roscher, Wolfgang; Hadicke, Udo; Knoll, Herbert; Seidel, Rudiger; Nemitz, Gunter; Sturmer, Edith; and Kaiser, Manfred, 4,043,938, Cl. 252-412.000.

Domain Industries, Inc.: *See—*
Grevich, John J., 4,043,709, Cl. 417-404.000.

Donaldson, Glenn B., Jr. Single point mooring terminal. 4,042,990, Cl. 9-8.00P.

Donley, Shawn T.; and Freitag, Valentine A., to United States of America, Navy. Autopilot hardover failure protection system. 4,043,526, Cl. 244-194.000.

Donnelly, Charles E.; and Sauve, Richard G., to FMC Corporation. Quick release troughing roll mounting. 4,043,447, Cl. 198-827.000.

Donnelly, Thomas H.; and McGinnis, Robert S., to Swift & Company. Gelatin manufacture-peroxide liquefaction process. 4,043,996, Cl. 260-118.000.

Dor, Inka. Process for promotion of algae growth in a sewage medium. 4,043,903, Cl. 210-22.00C.

Dorius, John O.: *See—*
Spencer, William H.; Dorius, John O.; and Brown, James D., 4,043,689, Cl. 403-252.000.

Dorr-Oliver Incorporated: *See—*
Wooh, Thomas, 4,043,920, Cl. 210-525.000.

Dorst, Hans Georg: *See—*
Wurmb, Rolf; Kunde, Joachim; Schlag, Johannes; and Dorst, Hans Georg, 4,043,971, Cl. 260-40.00R.

Dorst-Keramikaschinen-Bau Otto Dorst U. Dipl. -Ing. Walter Schlegel: *See—*
Schubart, Rolf Egon Romnald, 4,043,724, Cl. 425-218.000.

D'Ortenzio, Remo J., to Stromberg-Carlson Corporation. Comparison circuit for removing possibly false signals from a digital bit stream. 4,044,312, Cl. 328-165.000.

Doryokuro Kakunenryo Kaihatsu Jigyodan: *See—*
Tomomatsu, Kenichi, 4,043,187, Cl. 73-105.000.

Doty, Frederick L. Boat hull scrubbing apparatus. 4,043,286, Cl. 114-222.000.

Dotzel, Klaus-Peter: *See—*
Zeppernick, Friedrich; and Dotzel, Klaus-Peter, 4,043,013, Cl. 29-132.000.

Dow Badische Company: *See—*
Gardner, Henry C., 4,043,518, Cl. 242-45.000.

Dow Chemical Company, The: *See—*
Gritzner, Gerhard, 4,043,895, Cl. 204-301.000.
Howard, William L., 4,044,007, Cl. 544-185.000.
Kress, Paul Joseph; and Plepys, Raymond A., 4,043,960, Cl. 260-29.40R.
Rakshys, Joseph W., Jr.; and McKinley, Suzanne V., 4,043,948, Cl. 260-2.10E.

Downs, Edgar S. Portable door lock. 4,043,578, Cl. 292-290.000.

Drago, Leo; and Ries, Edmond, to Robreli Holding S.A. Method for packaging and dyeing yarns and yarn packaging obtained thereby. 4,042,989, Cl. 8-149.000.

Draxler, Helmut J., to New England Union Co. Valve with electrically operated actuator. 4,043,532, Cl. 251-11.000.

Dresser Industries, Inc.: *See—*
Dyer, Norman Dean, 4,043,600, Cl. 299-33.000.
Lichte, Carl Laurent, 4,043,411, Cl. 175-369.000.

Dressler, Wilfried: *See—*
Adler, Klaus; Pichler, Engelbert; Kemenater, Christoph; Dressler, Wilfried; and Bauer, Johann, 4,043,962, Cl. 260-29.300.

Dreyer, Wesley M.; and Huntington, Richard G., to General Dynamics Corporation. Support and load alleviation system for space vehicles. 4,043,524, Cl. 244-118.00R.

Dror, Michael: *See—*
Schmidt, Gerhard Martin Julius, deceased; Dror, Michael; Friedman, Gad; and Levine, Harold H., 4,043,978, Cl. 260-47.0CP.

Duchene, Jean: *See—*
Allain, Jacques; Duchene, Jean; and Merelli, Marc, 4,044,301, Cl. 324-33.000.

Dudek, Edmund C., to Thor Power Tool Company. Housing construction for a power tool. 4,043,222, Cl. 74-606.00R.

Dudley, Ronald J.: *See—*
Holm, James P.; and Dudley, Ronald J., 4,044,227, Cl. 235-61.70R.

Duetsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Bertram, Heidrun; Fahnenstich, Rudolf; and Tanner, Herbert, 4,044,169, Cl. 426-656.000.

Duling, Irl N.; Gates, David S.; Glazier, Frederick P.; and Moore, Robert E., to Sun Ventures, Inc. Friction or tractive drive containing ethers of adamantanes. 4,043,927, Cl. 252-52.00R.

Duncan, Richard D. Beverage container with integral straw. 4,043,478, Cl. 220-90.200.

Dunnigan, Daniel Ambrose: *See—*
Winn, Martin; Kyncl, Jaroslav; Dunnigan, Daniel Ambrose; and Jones, Peter Handley, 4,044,135, Cl. 424-251.000.

Dunning, Reginald: *See—*
Potter, William Duncan; Barclay, Andrew Conway; Dunning, Reginald; and Parry, Richard John, 4,043,327, Cl. 128-89.00R.

Du Pont de Nemours, E. I., and Company: *See—*
Beresniewicz, Aleksander; and Inskip, Harold Kirkwood, 4,043,961, Cl. 260-29.6WA.
Cochran, Stanley Robert; and Davis, Oren Hardin, 4,044,089, Cl. 264-167.000.
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Hauck, Frederic Peter; Reid, Joyce; Narayanan, Venkatachala L.; Cimarusti, Christopher M.; Haugwitz, Rudiger D.; and Sundeen, Joseph E., 4,044,040, Cl. 260-456.00P.

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Larson, Bernard J.; Johnson, Oliver Wendell; and Yip, James Kwok-fun, 4,043,419, Cl. 180-132.000.

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Stumpp, Gerhard; Eckert, Konrad; Runge, Detlev; and Wessel, Wolf, 4,043,304, Cl. 123-119.00A.

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Solomon, Richard L., 4,043,775, Cl. 55-302.000.

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Eheim, Franz, to Robert Bosch GmbH. Fuel injection pump with screw cap insert. 4,043,713, Cl. 417-499.000.

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Hatfield, Lowell D., 4,044,002, Cl. 544-16.000.
Koppel, Gary A., 4,044,000, Cl. 260-239.100.
Krumkalns, Eriks V., 4,043,790, Cl. 71-66.000.
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Entin, Yakov Borisovich: *See*—
Lebedev, Vladimir Konstantinovich; Chernenko, Ivan Alexeevich; Postolaty, Nikolai Ivanovich; Kuchuk-Yatsenko, Sergei Ivanovich; Tishura, Vladimir Ivanovich; Entin, Yakov Borisovich; Filippov, Alexandr Nikolaevich; and Martynov, Evgeny Petrovich, 4,044,219, Cl. 219-100.000.

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Etheridge, Jay D., to Sun Oil Company of Pennsylvania. Sample injection system for analyzers. 4,043,202, Cl. 73-422.0GC.

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Evans, Timothy W., to Upjohn Company, The. Process of purifying cholesterol oxidase. 4,043,870, Cl. 195-66.00R.

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Farrand, John M., to Design Mold Inc. Counterbore tool. 4,043,699, Cl. 408-201.000.
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Folk, Kenneth Foster; Ross, Milton Dean; and Shatto, Walter Clifton, Jr., to AMP Incorporated. Apparatus for inserting wires into terminals and for manufacturing electrical harnesses. 4,043,017, Cl. 29-749.000.
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Fusco, Anthony M., to Milliken Research Corporation. High temperature lubricant. 4,044,033, Cl. 260-404.000.
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Senior, Robert B.; and Karasinski, Frederick, 4,043,362, Cl. 140-1.000.
Gardner, Henry C., to Dow Badische Company. Positive yarn feeding device. 4,043,518, Cl. 242-45.000.
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Gates Rubber Company, The: *See*—
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Gavaler, John R., to Westinghouse Electric Corporation. Superconductive thin films having transition temperature substantially above the bulk materials. 4,043,888, Cl. 204-192.00S.
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Gays, Susan; and Romano, Anthony. Removable crib canopy. 4,043,349, Cl. 135-5.300.
Gaysert, Gerhard; and Ottle, Walter, to J. Eberspacher. Catalytic

converter having resilient monolith-mounting means. 4,043,761, Cl. 23-288.0FC.
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Wirth, Gary J.; and Gelder, Kenneth M., 4,043,445, Cl. 198-611.000.
Gelfand, Leonard, to Erico Products, Inc. Electrical contact. 4,043,893, Cl. 204-281.000.
Gellert, Jobst Ulrich. Injection molding nozzle seal. 4,043,740, Cl. 425-567.000.
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Bochan, John, 4,043,158, Cl. 68-17.00R.
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Carlson, Robert G., 4,043,703, Cl. 416-230.000.
Claybaker, LeRoy A., 4,043,954, Cl. 260-19.00A.
Dix, Joseph; Campbell, Norman; and Tonseth, Ivar S., Jr., 4,043,499, Cl. 228-173.000.
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Speir, Donald W.; and McHugh, Donald P., 4,043,508, Cl. 239-265.190.
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Thomas, William W.; and Sprunger, Elmore V., 4,043,121, Cl. 60-204.000.
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Weisgerber, Thomas W., 4,043,124, Cl. 60-404.000.
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Speck, Reinhold; and Forberger, Stefan, 4,043,295, Cl. 118-317.000.
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Gfroerer, Gerald T.: *See*—
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Gibbs, Stephen R., to Burroughs Corporation. Electrochemical anodization fixture for semiconductor wafers. 4,043,894, Cl. 204-297.00W.
Gibson, Harry W.; and Saeva, Franklin D., to Xerox Corporation. Electrostatographic carrier composition. 4,043,929, Cl. 252-62.10R.
Gibson, John, to Gewerkschaft Eisenhutte Westfalia. Drive assemblies for mining apparatus. 4,043,213, Cl. 74-242.800.
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Glotin, Bernard Jean-Pierre, to Schlumberger Technology Corporation. Anchoring device and running tool for downhole apparatus. 4,043,390, Cl. 166-215.000.
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Glowienke, Richard A. Fire fighting equipment. 4,043,397, Cl. 169-45.000.
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Gocke, Eberhard Wilhelm, to Braukmann Armaturen AG. Filter fitting for heating installations. 4,043,357, Cl. 137-495.000.
Godfrey, William L., to Mobil Oil Corporation. Temperature-responsive motor restart limiter. 4,044,288, Cl. 318-485.000.
Godin, Victor B.; and Bruck, Howard P., to Victor B. Godin, Trustee. Apparatus and method for cutting circles from sheet material. 4,043,234, Cl. 83-40.000.
Goetz, Alexander F. H.; Graham, Richard A.; and Ozawa, Tetsuo, to California Institute of Technology. Portable reflectance spectrometer. 4,043,668, Cl. 356-73.000.
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Gonzalez, Juan M.; and Nichols, William V., Jr., to Reynolds Metals Company. Aluminum reduction cell having a lateral enclosure system. 4,043,892, Cl. 204-247.000.
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Goodman, Steven J.; and Echevarria, Angel M., to Echevarria, Angel M. Body supporting and cushioning surface for bedding. 4,042,986, Cl. 5-335.000.
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Gottlieb, Nathan, to American Optical Corporation. Three-lens system providing a variable focal power along one principal meridian. 4,043,641, Cl. 350-181.000.

Gottshall, Edward R., to Mosser Industries, Inc. Sealing means for sliding gate valve. 4,043,534, Cl. 251-174.000.

Gould Inc.: *See*—
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Gould, Steven J.: *See*—
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Graham, Bruce A.; Puttock, Michael A.; Felauer, Ethel E.; and Neidermyer, Robert W., to Uniroyal, Inc.; and Uniroyal Ltd. Plant growth regulation using certain substituted 2,3-dihydro-1,4-oxathiins. 4,043,792, Cl. 71-78.000.

Graham, James T., to Android International, Inc. Fluid cam assembly. 4,043,122, Cl. 60-375.000.

Graham, Lloyd J., to Rockwell International Corporation. Acoustic white noise generator. 4,043,176, Cl. 73-1.0DV.

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Graser, Earl J., to Olinkraft, Inc. Method of packaging in carrier with drop down partition. 4,043,095, Cl. 53-26.000.

Grawey, Charles E., to Caterpillar Tractor Co. Method for forming a tube article on a core. 4,044,085, Cl. 264-90.000.

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Greenberg, Jerome S., to Regal China Corporation. Apparatus for casting in molds for the production of ceramic hollowware. 4,043,737, Cl. 425-434.000.

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Greenlee, Hugh T., to Wright Tool & Forge Company, The. Holder and display device for wrench sockets. 4,043,453, Cl. 206-349.000.

Greenwell, Joseph Daniel; and Scarpa, Eric W., to R. A. Jones & Co. Inc. Transfer mechanism. 4,043,442, Cl. 198-420.000.

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Griess, Roy K.: *See*—
Ferraiolo, Frank A.; and Griess, Roy K., 4,044,295, Cl. 363-54.000.

Griffin, Arthur F. Note pad construction. 4,043,573, Cl. 283-2.000.

Griffin, Lawrence C., to Griffin Research & Development, Inc. Polluted air effluent incinerating method. 4,044,099, Cl. 423-210.000.

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Griffin, Lawrence C., 4,044,099, Cl. 423-210.000.

Griffin, William Dale. Apparatus for removing concrete around exposed reinforcing rod. 4,043,408, Cl. 175-416.

Griffith, William S.: *See*—
Glomb, Frank A.; and Griffith, William S., 4,043,547, Cl. 269-136.000.

Gritzner, Gerhard, to Dow Chemical Company, The. Electrophoresis apparatus. 4,043,895, Cl. 204-301.000.

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Bascope, Alberto H.; and Grizzard, Eugene H., 4,043,912, Cl. 210-83.000.

Grobman, William, to Molins Macine Company, Inc. Ink level warning system. 4,043,265, Cl. 101-350.000.

Groeper, Lawrence H. Portable wheel-balancer. 4,043,218, Cl. 73-486.000.

Groezinger, John J.: *See*—
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Gruffaz, Max; and Lefebvre, Gerard, to Rhone-Poulenc Industries. Polymers possessing imide groups. 4,043,986, Cl. 260-78.0UA.

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Dezael, Claude; Franckowiak, Sigismond; Courty, Philippe; and Gruhier, Henri, 4,044,114, Cl. 423-574.00R.

Grundy, Reed H., to Westinghouse Air Brake Company. Converter-regulator circuit arrangement. 4,044,294, Cl. 363-25.000.

GTE Laboratories Incorporated: *See*—
Bowerman, Edwin R., 4,044,377, Cl. 358-107.000.

GTE Sylvania Incorporated: *See*—
Keeffe, William M.; and Koury, Frederic, 4,044,276, Cl. 313-218.000.
Lafferty, William Daniel; Smith, James Thomas; and Rench, Nicholas Wayne, 4,043,716, Cl. 425-6.000.
Stites, Francis H.; and Weir, Colin B., 4,044,308, Cl. 325-144.000.

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Guerbet, Francois. Suspension system. 4,043,571, Cl. 280-716.000.

Guido, Jurgen; and Stock, Robert. Injection line system. 4,043,506, Cl. 239-76.000.

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Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., 4,044,144, Cl. 424-269.000.

Gullo, Robert, to Typographic Innovations Inc. Drum control system. 4,044,290, Cl. 318-640.000.

Gulton Industries, Inc.: *See*—
Mounteer, Carl A.; and Sizgorich, Anthony T., 4,043,197, Cl. 73-205.00R.

Gunther, Gerhard; and Stillig, Josef, to Leuze-Electronic KG. Arrangement for automatically controlling the travel speed of yarns, filaments, and the like in machines processing the same. 4,043,107, Cl. 57-34.00R.

Gupta, Viney Kumar, to Matrix, Inc. Variable venturi nozzle-matrix carburetor add methods for intermixing fuel and air. 4,044,077, Cl. 261-23.00A.

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Hanifin, John William, Jr.; Gussin, Robert Zalmon; and Cohen, Elliott, 4,044,021, Cl. 548-312.000.

Gustav F. Gerdts KG: *See*—
Schutzer, Gerhard, 4,043,425, Cl. 184-55.00A.

Guswiler, Gerald W. Teaching aid. 4,043,057, Cl. 35-74.000.

H. Berthold AG: *See*—
Wingerter, Franz Adolf, 4,043,660, Cl. 355-43.000.

Haag, Albrecht; and Siefert, Roland, to Kienzle Uhrenfabriken GmbH. Pendulum device for battery-powered clockwork mechanism. 4,043,118, Cl. 58-152.00R.

Haas, Frederick T., Jr., to MOD-SOD Sport Surfaces. Playing surface for athletic games. 4,044,179, Cl. 428-17.000.

Hackett, Kenneth R., to Snotrix Division of Pittway Corporation. Stabilized ball joint. 4,043,686, Cl. 403-90.000.

Hadicke, Udo: *See*—
Reif, Hans-Heinrich; Wehner, Klaus; Welker, Jurgen; Schmidt, Karl-Heinz; Schnick, Waltraud; Widmann, Lutz; Schicker, Otto; Seidel, Gunter; Kalb, Karsten; Dollase, Wolfhard; Furtig, Helmut; Hose, Werner; Roscher, Wolfgang; Hadicke, Udo; Knoll, Herbert; Seidel, Rudiger; Nemitz, Gunter; Sturmer, Edith; and Kaiser, Manfred, 4,043,938, Cl. 252-412.000.

Hafer, Paul R., to Boyertown Auto Body Works. Floating window assembly for vehicles. 4,043,586, Cl. 296-84.00C.

Hainaut, Daniel; Demoute, Jean-Pierre; and Teche, Andre, to Roussel Uclaf. Selective herbicidal compositions. 4,043,796, Cl. 71-98.000.

Hall, Charles M.: *See*—
Wright, John B.; and Hall, Charles M., 4,044,148, Cl. 424-317.000.

Hall, Samuel D., Jr., to Teledyne Isotopes. Flexible sleeve thermal path device for thermoelectric converter element pressure loading force application spring. 4,043,835, Cl. 136-221.000.

Halliburton Company: *See*—
Dial, Darrell D.; and von Bose, Robert J., 4,043,545, Cl. 267-116.000.

Halmosi, Rudolph; Schneider, Karl W.; and Weidman, John F., to General Motors Corporation. Track shoe. 4,043,610, Cl. 305-19.000.

Halter, Jerome Barth, to RCA Corporation. Method and apparatus for electromechanical recording of short wavelength modulation in a metal master. 4,044,379, Cl. 358-128.000.

Halvorsen, Tor Svein; and Saxlund, Oddmund, to Saxlund nee Erichsen, Astrid Alice. Bin with discharge device. 4,043,488, Cl. 222-233.000.

Hamaguchi, Ichiro; and Toyoda, Kenji, to Nippon Kogaku K.K. Device for checking a d c source voltage relative to a predetermined value. 4,044,304, Cl. 324-133.000.

Hambling, Peter G.; Owen, Leslie W., deceased; by Owen, Elizabeth Bertram, executrix; and by Mould, George, executor, to Xerox Corporation. Method for electroforming. 4,043,876, Cl. 204-9.000.

Hamma, Noritaka; Fukumura, Masataka; Maeshima, Kaoru; and Nakagome, Takenari, to Sumitomo Chemical Company, Limited. Preparation of peptides and cephalosporins. 4,043,991, Cl. 260-112.50R.

Hammel, Ronald O.; and Coleman, Charles E., to Gates Rubber Company, The. Multiple power source automatic switching circuitry. 4,044,268, Cl. 307-66.000.

Hammond Corporation: *See*—
Schrecongost, Ray B.; and Perutis, Edward J., 4,043,244, Cl. 84-423.000.

Hamworthy Engineering Limited: *See*—
Wray, Stanley William; and Warwick, Michael George, 4,043,280, Cl. 110-7.00R.

Hanazono, Masanobu; Asai, Osamu; and Ono, Kunio, to Hitachi, Ltd. Thin film magnetic head with a center tap. 4,044,394, Cl. 360-123.000.

Hancock, Frank John Thompson, to Imperial Chemical Industries Limited. Drying plastics. 4,043,050, Cl. 34-48.000.

Hand, Arthur S., Jr., to FMC Corporation. Rotary car dumper with shiftable frame. 4,043,467, Cl. 214-52.00C.

Hanifin, John William, Jr.; Gussin, Robert Zalmon; and Cohen, Elliott, to American Cyanamid Company. Tetrasubstituted imidazolidine diuretics useful in the treatment of hyperaldosteronism. 4,044,021, Cl. 548-312.000.

Hannah, John: *See*—
Rogers, Edward F.; Hannah, John; and Dybas, Richard A., 4,044,133, Cl. 424-251.000.

Hansen, Howard C., to Clark Equipment Company. Material storage frame support and vehicle guide structure. 4,043,463, Cl. 214-16.40A.

Hansen, Rolf Steen; Lie, Ole Hannibal; Nilsen, Henning Reier; and Sandal, Thor, to Norsk Hydro a.s. Process for manufacturing of phosphoric acid. 4,043,789, Cl. 71-34.000.

Hanson, Edwin E.: *See*—
Beals, Charles E.; Chambers, Robert O.; Hanson, Edwin E.; and Satzler, Ronald L., 4,043,227, Cl. 74-868.000.

Hapke, Kenyon A., to Bell & Howell Company. Film handling device. 4,043,650, Cl. 353-15.000.

Happel, Dieter: *See*—
Lindner, Heinz; and Happel, Dieter, 4,043,153, Cl. 66-120.000.

Harbar, John Richard: *See*—
Evans, Leslie Samuel; Bones, Roger John; and Harbar, John Richard, 4,044,191, Cl. 429-104.000.
Evans, Leslie Samuel; and Harbar, John Richard, 4,044,194, Cl. 429-104.000.

Harding, Richard P.: *See*—
Breault, Richard D.; Harding, Richard P.; and Kemp, Fred S., 4,043,933, Cl. 252-182.000.

Hari, Stefan; Irvine, Alexander McHugh; McCrae, James McGeachie; Vuitel, Laurent; and L'Eplattenier, Francois, to Ciba-Geigy Corporation. Metal complexes of bis-azomethines from hydroxy-aldehydes and alkylene diamines. 4,044,036, Cl. 260-438.100.

Harnisch, Heinz: *See*—
Cremer, Joseph; Joerchel, Egon; and Harnisch, Heinz, 4,044,104, Cl. 423-302.000.

Harris, David E.; Watson, Robert M.; and Redmyer, John D., to Autech Corporation. Reticle calibrated diameter gauge. 4,043,673, Cl. 356-160.000.

Harris, Walter William, to Johns-Manville Corporation. Electric resistance bushing for melting inorganic materials. 4,043,778, Cl. 65-1.000.

Harrison, Derek Ralph: *See*—
Taylor, John Bodenham; and Harrison, Derek Ralph, 4,044,142, Cl. 424-250.000.

Harshaw Chemical Company, The: *See*—
Moss, Robert H.; Swinehart, Carl F.; and Spicuzza, William F., 4,044,112, Cl. 423-490.000.
Rosette, King Harry, 4,044,082, Cl. 264-1.000.

Hart, James E., to Westinghouse Air Brake Company. Emergency portion for a brake control valve. 4,043,604, Cl. 303-33.000.

Hart, James E., to Westinghouse Air Brake Company. Emergency portion for a brake control valve. 4,043,605, Cl. 303-37.000.

Hart, William D., to Hughes Aircraft Company. Electric watch battery retainer. 4,043,113, Cl. 58-23.0BA.

Hartjens, Hermen; and Day, Arnold, to American Cyanamid Company. Tri-carboxylated and tetra-carboxylated fatty acid aspartates as flotation collectors. 4,043,902, Cl. 209-166.000.

Hartline, Albert G., III; and Kindlimann, Lynn E., to Allegheny Ludlum Industries, Inc. Internal nitridation of cobalt-base superalloys. 4,043,839, Cl. 148-20.300.

Hartline, Stephen D.: *See*—
Washburn, Malcolm E.; and Hartline, Stephen D., 4,043,823, Cl. 106-40.00R.

Hartman, Marvis E.: *See*—
Chang, Wen-Hsuan; Hartman, Marvis E.; and Scriven, Roger L., 4,043,953, Cl. 260-18.00S.

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Hartung, Ronald F.: *See*—
Trumbull, Harold E.; and Hartung, Ronald F., 4,043,471, Cl. 214-152.000.

Hasebe, Nobuhisa: *See*—
Saito, Katashi; Matsumoto, Toshio; Hasebe, Nobuhisa; and Kobatake, Tatsuo, 4,043,382, Cl. 164-76.000.

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Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, to Hoffmann-La Roche Inc. Substituted phenyl ketones. 4,044,017, Cl. 260-295.0AM.

Hasselblad, Fritz Victor: *See*—
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Hastings, William G.: *See*—
Hickman, Charles E.; and Hastings, William G., 4,043,015, Cl. 29-157.400.

Hataya, Fumio: *See*—
Fukui, Yutaka; Hataya, Fumio; Sasaki, Ryoichi; Nakajima, Fumito; Matsuda, Shimpei; Tonami, Munehiko; and Hiraga, Ryo, 4,043,945, Cl. 252-466.00J.

Hatfield, Lowell D., to Eli Lilly and Company. Reduction process for cephalosporin sulfoxides. 4,044,002, Cl. 544-16.000.

Hatley, William T., Jr., to ESL Incorporated. Adaptive matched digital filter. 4,044,241, Cl. 235-152.000.

Hattori, Yoshiyuki; Suzuki, Mikio; and Taguchi, Masahiro, to Nippon Soken, Inc. Air bag device for vehicles. 4,043,572, Cl. 280-738.000.

Hauck, Frederic Peter; Reid, Joyce; Narayanan, Venkatachala L.; Cimarusti, Christopher M.; Haugwitz, Rudiger D.; and Sundeen, Joseph E., to E. R. Squibb & Sons, Inc. 4,7-Dihydroindanyl alkanols, analogues thereof and their corresponding tosylates. 4,044,040, Cl. 260-456.00P.

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Hauck, Frederic Peter; Reid, Joyce; Narayanan, Venkatachala L.; Cimarusti, Christopher M.; Haugwitz, Rudiger D.; and Sundeen, Joseph E., 4,044,040, Cl. 260-456.00P.

Hauni-Werke Korber & Co. KG: *See*—
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Hausmann, Taddaus: *See*—
Bourg, Guillaume; Christ, Hubertus; Hausmann, Taddaus; and Sales, Louis, 4,043,608, Cl. 303-104.000.

Hawkins, Richard T., to Phillips Petroleum Company. Symmetrical aromatic sulfide production. 4,044,056, Cl. 260-609.00E.

Haws, James L.; Quinney, Douglas W.; and Richards, Frank A., to United States of America, Air Force. Heat pipe cooling of airborne phased array radar. 4,044,396, Cl. 361-385.000.

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Hayami, Satohiro; Imamura, Jun; Hayakawa, Hiroshi; and Yabuta, Tadatzugu, 4,043,805, Cl. 75-123.00L.
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Okutsu, Eiichi; Hayashi, Katsumi; Moriuchi, Shigenori; and Sakai, Takeo, 4,043,817, Cl. 96-66.00R.

Hedstrom, Bengt Olof-Arvid. Process and apparatus for flash drying fluffed cellulose pulp. 4,043,049, Cl. 34-10.000.

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Pollich, Gerhard, 4,043,548, Cl. 271-80.000.

Heimberger, Helmut, to OPTI Patent-, Forschungs- und Fabrikations-AG. Warp-knit slide-fastener support tape and stringer. 4,043,007, Cl. 24-205.10C.

Heine, Helmut A.; Schmidt, Otto H.; and Spitschan, Hans J., to Propper Manufacturing Co., Inc. Filter mechanism with interconnected heat and color filters for optical examination devices. 4,043,646, Cl. 350-315.000.

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Kratzmann, Helmut; Heinik, Josef; Obermaier, Robert; Zentner, Erich; and Redinger, Robert, 4,043,731, Cl. 425-366.000.

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Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, 4,044,164, Cl. 426-535.000.

Heinz, Richard A. Replaceable slip ring rotor. 4,043,621, Cl. 308-189.00R.

Heitman, LeRoy Marvin. Ground-shaping systems for a backhoe bucket. 4,043,061, Cl. 37-141.00R.

Heitmann, Hans-Gunther, to Kraftwerk Union Aktiengesellschaft. Nuclear power plant having a pressurized-water reactor. 4,043,864, Cl. 176-37.000.

Held, Manfred, to Messerschmitt-Bolkow-Blohm GmbH. Hollow charge construction and method of forming a hollow charge lining. 4,043,266, Cl. 102-24.0HC.

Helmer, John Colville, to Varian Associates, Inc. Method and apparatus for reducing the transient effects of liquid compressibility in a liquid chromatography system. 4,043,906, Cl. 210-31.00C.

Hems, Roger: *See*—
Rowsell, David G.; and Hems, Roger, 4,044,120, Cl. 424-48.000.

Henault, Claude, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Control device for regulating the compositions of the inlet and exhaust gases of an internal combustion engine. 4,043,305, Cl. 123-119.00A.

Hendry, James W., to Ex-Cell-O Corporation. Pumped injection of gas for making foamed plastic. 4,043,715, Cl. 425-4.00R.

Henkel & Cie GmbH: *See—*
Kubersky, Hans Peter; and Weinrich, Erwin, 4,043,750, Cl. 8-10.200.

Henzl, Jerry, to Crane Packing Company. O-ring mold. 4,043,727, Cl. 425-578.000.

Herbert Management Co., Inc.: *See—*
Hyslop, Robert C., 4,042,992, Cl. 14-69.500.

Herbst, Edward J., to Continental Can Company, Inc. Scored metal flap areas. 4,043,481, Cl. 220-266.000.

Herbst, LeRoy J.: *See—*
Jenkins, Thomas E.; and Herbst, LeRoy J., 4,044,224, Cl. 219-322.000.

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Hercules Incorporated: *See—*
Wagar, Nelson William, 4,043,824, Cl. 106-48.000.

Herff, Anthony P., to Bell & Howell Company. Data coding and error correcting methods and apparatus. 4,044,328, Cl. 340-146.1AG.

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Hermann, Eduard. Circuit arrangement for a repetition-blocking device. 4,044,269, Cl. 307-149.000.

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Herrington, Richard A.: *See—*
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Hess, Hans-Jurgen E.: *See—*
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Hess, Howard V.: *See—*
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Heuser, Jurgen: *See—*
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Krasser, Fritz; Heydner, Konrad; and Ellenberger, Horst, 4,044,325, Cl. 337-66.000.

Hi-Shear Corporation: *See—*
Bunker, James W., 4,043,000, Cl. 16-128.00R.

Hiatt, Martin H. Counter current decantation apparatus. 4,043,760, Cl. 23-270.00R.

Hickman, Charles E.; and Hastings, William G., to Brazeway, Inc. Method of forming a header assembly. 4,043,015, Cl. 29-157.400.

Hicks, Glen LeRoy; Howe, Leland Delmar, Jr.; and Zurla, Frank Anthony, Jr., to International Business Machines Corporation. Instruction retry mechanism for a data processing system. 4,044,337, Cl. 364-200.000.

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Hill, David George: *See—*
Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, 4,044,138, Cl. 424-258.000.

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Adams, James S.; and Cutler, Charles W., 4,044,286, Cl. 318-297.000.

Himmelmann, Wolfgang; Ranz, Erwin; and Roche, Edy, to AGFA-Gevaert, A.G. Process for hardening photographic layers with carbodiimide compounds containing sulphobetaine groups. 4,043,818, Cl. 96-77.000.

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Jeffery, Edwin A.; and Hinlein, Sigmund, 4,043,632, Cl. 350-7.000.

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Hintermeister, Edouard. Device for sterilizing swimming-pool water. 4,043,913, Cl. 210-169.000.

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Hirsh, Ivan Y., to Molins Limited. Testing of cigarettes. 4,043,182, Cl. 73-41.000.

Hisamatsu, Tokuichi; Kitamura, Taketsugu; Saito, Takeshiro; Takagi, Hitoshi; and Sekiya, Takuzo, to Asahi Kasei Kogyo Kabushiki Kaisha. Method of treating exhaust gases containing nitrogen oxides and sulfurous acid gas. 4,044,101, Cl. 423-235.000.

Hitachi, Ltd.: *See—*
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Iwamatsu, Seiichi, 4,043,024, Cl. 29-571.000.
Kanda, Hiroshi; Katakura, Kageyoshi; and Suzuki, Takaji, 4,044,273, Cl. 310-313.000.
Kashioka, Seiji; Kameyama, Masayoshi; Ejiri, Masakazu; and Miyatake, Takahumi, 4,044,311, Cl. 328-139.000.
Matsuyama, Sigeru; Tanaka, Hironari; Koyama, Masaharu; and Ishibashi, Tadashi, 4,043,639, Cl. 350-160.0LC.
Nomiya, Kosei; Kohisa, Toshihiko; and Matsumura, Isao, 4,044,373, Cl. 357-41.000.
Oue, Michio; Asai, Osamu; Iwasaki, Kishiro; and Kawakami, Hideaki, 4,043,647, Cl. 350-320.000.
Shimano, Masaru; and Aizawa, Iwao, 4,044,381, Cl. 358-160.000.
Tsuzurahara, Mamoru; and Ohara, Ichiro, 4,044,279, Cl. 315-39.510.
Wada, Hidetsugu; Asano, Yoichi; and Suzumura, Yoshikazu, 4,044,344, Cl. 340-173.0DR.
Watanabe, Kiyoshi; Sunahara, Kazuo; Terao, Motoyasu; and Fujita, Tsutomu, 4,043,748, Cl. 432-253.000.

Hitachi Maxell, Ltd.: *See—*
Amemiya, Masahiro; and Asada, Seiichi, 4,043,846, Cl. 148-105.000.

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Hiyama, Kunihiko: *See—*
Nishino, Mutsumi; Sasaki, Hideo; Uda, Kazumi; Tamura, Motohiko; Hiyama, Kunihiko; and Fujiike, Hiroshi, 4,043,769, Cl. 55-25.000.

Hobart Corporation: *See—*
Brackman, Donald A., 4,043,002, Cl. 17-32.000.

Hoberg, Heinz; and Schulz, Erwin. Process and apparatus for sorting refuse. 4,043,513, Cl. 241-24.000.

Hochiki Corporation: *See—*
Minowa, Osami, 4,044,262, Cl. 250-381.000.

Hochtief AG: *See—*
Jutte, Hans; Babendererde, Siegmund H.F.L.M.; Foik, Adolf; and Bokemeyer, Reinhard E. J., 4,043,137, Cl. 61-85.000.

Hoechst Aktiengesellschaft: *See—*
Cremer, Joseph; Joerchel, Egon; and Harnisch, Heinz, 4,044,104, Cl. 423-302.000.
Kostrzewa, Michael; Holst, Arno; and Buchberger, Gerhard, 4,044,198, Cl. 536-86.000.
Kratzmann, Helmut; Heinik, Josef; Obermaier, Robert; Zentner, Erich; and Redinger, Robert, 4,043,731, Cl. 425-366.000.
Vock, Gunther, 4,043,985, Cl. 260-75.00T.

Hoes, Klaus Gerd; and Wobken, Gerold, to Klaus-Gerd Hoes, Firma. Trench cutter for excavating trenches and for laying water pipes and drainage pipes. 4,043,135, Cl. 61-72.500.

Hoffeins, Hans, to Brown Boveri-Sulzer Turbomaschinen AG. Starting arrangement for combined air and gas turbine power plant. 4,043,120, Cl. 60-39.140.

Hoffman, Richard E.; and Lindsay, Edward K., to United States of America, Navy. Polymeric-coated HMX crystals for use with propellant materials. 4,043,850, Cl. 149-19.400.

Hoffmann-La Roche Inc.: *See—*
Bollag, Werner; Rigassi, Norbert; and Schwieter, Ulrich, 4,044,051, Cl. 260-514.00R.
Gerecke, Max; Kaplan, Jean-Pierre; and Kyburz, Emilio, 4,044,010, Cl. 260-268.0TR.
Hassall, Cedric Herbert; Johnson, William Henry; Krohn. Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,044,017, Cl. 260-295.0AM.
Kienzle, Frank; and Rosen, Perry, 4,044,005, Cl. 542-426.000.
Kiss, Joseph; and Berg, Klaus Peter, 4,043,937, Cl. 252-407.000.
Rosen, Perry, 4,044,022, Cl. 548-369.000.
Rosenberger, Michael; and Saucy, Gabriel, 4,044,028, Cl. 260-348.110.

Saucy, Gabriel; and Scott, John William, 4,044,004, Cl. 260-239.55C.
Sternbach, Leo Henryk; and Walser, Armin, 4,044,016, Cl. 260-295.00F.
Hoggard, Anthony J., to Tomar Corporation. Arrowhead extractor. 4,043,020, Cl. 29-427.000.
Hokes, James J.: *See*—
Morine, Richard L.; and Hokes, James J., 4,043,294, Cl. 118-9.000.
Holladay, James F.; Starnes, R. Emory; Gentry, Bobby C.; Jones, W. Carl; and Lowery, James O., to Southwire Company. Method and apparatus for continuous production of NM cable. 4,043,851, Cl. 156-47.000.
Holland, Dennis P. Water ski tow handle. 4,043,290, Cl. 115-6.100.
Holliday, Odell. Air mattress. 4,042,988, Cl. 5-349.000.
Hollingsead-Pryor Enterprises: *See*—
Lapes, Rubin, 4,043,631, Cl. 339-252.00R.
Hollister, Geoffrey L.; and Vixie, Dennis E., to BRS, Inc. Athletic training shoe having foam core and apertured sole layers. 4,043,058, Cl. 36-102.000.
Hollon, James F. Mud flap assembly. 4,043,568, Cl. 280-154.50R.
Holly, Harry H., to Hollymatic Corporation. Molding apparatus. 4,043,728, Cl. 425-256.000.
Hollymatic Corporation: *See*—
Holly, Harry H., 4,043,728, Cl. 425-256.000.
Holm, James P.; and Dudley, Ronald J., to Upjohn Company, The. Bar code reader. 4,044,227, Cl. 235-61.70R.
Holst, Arno: *See*—
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Holstrom, Geoffrey B.: *See*—
Egan, Dale W.; Gilbert, Lyman F.; Lord, Harry C.; Opel, Alan E.; and Holstrom, Geoffrey B., 4,043,742, Cl. 431-12.000.
Holzinger, Otto; and Pross, Wilhelm, to Carl Zeiss Stiftung. Photometer. 4,043,676, Cl. 356-226.000.
Homm, Roger; and Katz, Gilbert, to Ortho Pharmaceutical Corporation. Pharmaceutical formulation applicator device. 4,043,338, Cl. 128-260.000.
Honeywell Inc.: *See*—
Abdelrahman, Mona M.; and Daughton, James M., 4,044,371, Cl. 357-28.000.
Berg, Robert O., 4,044,339, Cl. 340-173.00R.
Honeywell Information Systems, Inc.: *See*—
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Johnson, Robert B.; and Nibby, Chester M., Jr., 4,044,330, Cl. 340-166.00R.
Tippetts, Kenneth Boyd, 4,043,485, Cl. 221-312.00R.
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Honjo, Satoru; and Fukushima, Osamu, to Xerox Corporation. Method and apparatus for fixing toner images. 4,043,052, Cl. 34-122.000.
Honma, Toyokuni: *See*—
Tomita, Kazuo; Murakami, Tadashi; Yamazaki, Yoshio; and Honma, Toyokuni, 4,044,018, Cl. 260-307.00A.
Hooker Chemicals & Plastics Corporation: *See*—
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Hopp, Hans: *See*—
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Hori, Kikuo: *See*—
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Hornick, John Robert. Dental treatment control unit. 4,043,041, Cl. 32-22.000.
Hornstein, Jack: *See*—
Bush, Bill R.; and Hornstein, Jack, 4,043,089, Cl. 52-516.000.
Horsfall, Harry: *See*—
Ashfield, Herbert Edward; and Horsfall, Harry, 4,043,546, Cl. 267-162.000.
Horsman, William W.: *See*—
Zens, Rene Joseph Louis; and Horsman, William W., 4,043,420, Cl. 181-117.000.
Horvath, Tibor, to Aquology Corporation. Aquarium pump with aeration. 4,043,914, Cl. 210-169.000.
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Hoseney, Russell C.; Seib, Paul A.; and Deyoe, Charles W., to Kansas State University Research Foundation, The. Salts of 6-O-acyl ascorbic acid for yeast-raised baked products. 4,044,154, Cl. 426-21.000.
Hoseney, Russell C.; and Ling, Rujira Srisuthep, to Kansas State University Research Foundation, The. Nonfat dry milk substitute for yeast-leavened baked products. 4,044,155, Cl. 426-62.000.
Hoshi, Koichi: *See*—
Kato, Takashi; Hoshi, Koichi; and Nakamura, Norihiko, 4,043,309, Cl. 123-191.0SP.
Hosokawa, Minoru: *See*—
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Hotchkiss, John Devlin; and Hotchkiss, William Henry, to John D. Hotchkiss Limited. Bearing assembly. 4,043,622, Cl. 308-208.000.
Hotchkiss, William Henry: *See*—
Hotchkiss, John Devlin; and Hotchkiss, William Henry, 4,043,622, Cl. 308-208.000.
Houghtaling, Samuel V., to Davy Powergas, Inc. Process for the manufacture of wet process phosphoric acid using wet-grinding of the phosphate rock feed. 4,044,107, Cl. 423-320.000.
Hounsfield, Godfrey Newbold, to EMI Limited. Radiography. 4,044,260, Cl. 250-360.000.
Hovey, Richard J., to American Optical Corporation. Photochromic light valve. 4,043,637, Cl. 350-160.00P.
Howard, William L., to Dow Chemical Company, The. Stabilization of biocidal composition. 4,044,007, Cl. 544-185.000.
Howarth, Graham Arton; and Gainer, James, to Ciba-Geigy Corporation. Compositions for the control of microorganisms. 4,044,130, Cl. 424-248.560.
Howe, John G.; and Schmidt, William L., to AMF Incorporated. Method of making plastic ski. 4,044,083, Cl. 264-45.300.
Howe, Leland Delmar, Jr.: *See*—
Hicks, Glen LeRoy; Howe, Leland Delmar, Jr.; and Zurla, Frank Anthony, Jr., 4,044,337, Cl. 364-200.000.
Howell, James B., to Advertising Displays Corporation. Dividers and partitions for same. 4,043,456, Cl. 211-184.000.
Howells, Paul W.: *See*—
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Hoya Glass Works, Ltd.: *See*—
Izumitani, Tetsuro; Fukuoka, Yasuo; and Yamashita, Toshiharu, 4,043,852, Cl. 106-53.000.
Hoyt, Deryl R., to Clark Equipment Company. Load back rest for lift truck. 4,043,472, Cl. 214-750.000.
Hsueh, Limin: *See*—
Lingane, Peter James; Cathles, Lawrence MacLagan, III; and Hsueh, Limin, 4,043,599, Cl. 299-4.000.
Hubbard, James Henry, to International Business Machines Corporation. Electronic copy selection controls for a document reproduction machine. 4,044,232, Cl. 235-92.0SB.
Huber, Georg: *See*—
Hartmann, Job-Werner; Falk, Roland; Krug, Aribert; Huber, Georg; Balz, Werner; and Mahler, Karl, 4,043,297, Cl. 118-640.000.
Huber, Josef: *See*—
Auspurg, Heinz; and Huber, Josef, 4,044,333, Cl. 364-200.000.
Hudson, Lawrence Keith; Savage, Kenneth I.; and Stinson, John M., Jr., to Aluminum Company of America. Process for recovery of alumina from high-silica ore. 4,044,095, Cl. 423-127.000.
Hudson Oxygen Therapy Sales Company: *See*—
Steward, William L., 4,043,856, Cl. 156-195.000.
Huebscher, Richard G., to Gould Inc. Circuit energization indicator with thermal timing means to maintain the indication for a predetermined time after de-energization. 4,044,348, Cl. 340-227.100.
Hueil, J. Charles; and Rothfuss, Robert G., to Senco Products, Inc. Staple cartridge and feed means for use with a surgical stapling instrument. 4,043,504, Cl. 227-116.000.
Huffman, Allan M., to American Color & Chemical Corporation. Process for dyeing blended nylon carpet material. 4,043,749, Cl. 8-1.0XB.
Hughes Aircraft Company: *See*—
Brown, Wilbur P., Jr., 4,044,247, Cl. 250-199.000.
Hart, William D., 4,043,113, Cl. 58-23.0BA.
Lamp, Thomas R., 4,043,387, Cl. 165-105.000.
Washburn, Robert D., 4,044,281, Cl. 315-171.000.
Wilmot, Richard D., 4,044,352, Cl. 343-5.0VQ.
Hughes, Austin; and Lawrenson, Peter John, to National Research Development Corporation. Electric stepper motors. 4,044,291, Cl. 318-696.000.
Huhnke, Dieter: *See*—
Emschermann, Hans Heinrich; Fuhrmann, Bruno; and Huhnke, Dieter, 4,044,238, Cl. 235-151.100.
Hull, R. Dell. Casting reel for fishing. 4,043,521, Cl. 242-84.410.
Hum, Bing W. Process for making artificial rocks. 4,043,826, Cl. 106-90.000.
Humber, Leslie G.: *See*—
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Hume, Graeme Reginald. Stressed hollow concrete cylinders. 4,044,088, Cl. 264-130.000.
Humlong, Robert F., to Wald Manufacturing Company, Inc. Bicycle stem. 4,043,688, Cl. 403-209.000.
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Humphrey, William E., 4,043,644, Cl. 350-295.000.
Humphrey, William E., to Humphrey Instruments, Inc. Elastically compensated off-axis mirror. 4,043,644, Cl. 350-295.000.
Hund, Werner, to Spieth-Maschinenelemente GmbH & Co. Kg. Axial thrust collar. 4,043,692, Cl. 403-373.000.
Hunt, John Harold: *See*—
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Hunter, Joe S.; and Little, Little J., to United States of America, Army. Magnetic fluid bearing accelerometer. 4,043,204, Cl. 73-516.00R.

Hunting, Curtis J. Digital thermodynamic flow-meter. 4,043,195, Cl. 73-204.000.

Huntington, Richard G.: *See—*
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Huper, Fritz; Rauenbusch, Erich; Schmidt-Kastner, Gunter; Bomer, Bruno; and Bartl, Herbert, to Bayer Aktiengesellschaft. Crosslinked copolymers of α,β-olefinically unsaturated dicarboxylic anhydrides. 4,044,196, Cl. 526-271.000.

Hurst, John, to W. R. Grace Limited. Separator for concrete wrapping to submarine pipelines. 4,044,091, Cl. 264-251.000.

Hutt, Marland Paul: *See—*
Wittle, Eugene Leroy; Nicolaides, Ernest D.; and Hutt, Marland Paul, 4,043,994, Cl. 260-112.5LH.

Hutton, Thomas W.; Miller, John J.; Wempe, Lawrence K.; and Lewis, Sheldon N., to Rohm and Haas Company. Hydrocurable oxazolidine polyanhydride compositions. 4,043,956, Cl. 260-23.00R.

Hutzler, Hagen, to Hermann Finckh Maschinenfabrik. Pressure screen with turbulence chamber means. 4,043,919, Cl. 210-407.000.

Hwang, Sang-Hak: *See—*
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Hyams, Joseph Edward, to Vic-Tree (Mouldings) Limited. Fasteners. 4,043,685, Cl. 403-19.000.

Hycel, Inc.: *See—*
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Hyslop, Robert C., to Herbert Management Co., Inc. Portable reinforced loading ramp. 4,042,992, Cl. 14-69.500.

I & I Sling Co., Inc.: *See—*
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Ice Cream Engineering di G. Tanara & C. S.a.s.: *See—*
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Ichimi, Shigeru; Ichimi, Hideo; and Funabashi, Kenjiro. Emergency gas shut-off unit mounted on gas pressure adjusting unit. 4,043,350, Cl. 137-39.000.

Ichimiya, Touru; and Oosawa, Koichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Auxiliary apparatus for hot-starting internal combustion engine. 4,043,310, Cl. 123-179.00G.

Illinois Range Company: *See—*
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Imamura, Jun: *See—*
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Imperial Chemical Industries Limited: *See—*
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Hancock, Frank John Thompson, 4,043,050, Cl. 34-48.000.
Jones, Michael Edward Benet; Jones, Eileen; and Jaworzyn, Joseph Franciszek, 4,042,978, Cl. 3-1.000.
Martin, Graham Ernest; and Cockshott, Ian Derek, 4,043,331, Cl. 128-156.000.

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Inaba, Shigeho: *See—*
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Indiana University Foundation: *See—*
Novotny, Milos V; and Grohmann, Karel, 4,043,905, Cl. 210-31.00C.

Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft: *See—*
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Ing. C. Olivetti & C., S.p.A.: *See—*
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Daly, Dante, 4,043,439, Cl. 197-18.000.

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Stageboe, Jan; and Einstabland, Tomas Berge, 4,043,138, Cl. 61-88.000.

Ingle, Harold R., Jr. Non-destructive testing of bonding laminates. 4,043,179, Cl. 73-37.000.

Ingwersen, Walter: *See—*
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Inokuchi, Toshiyuki, to Ricoh Co., Ltd. Optical scanning apparatus. 4,044,384, Cl. 358-293.000.

Inoue, Nobuyoshi, to Copal Company Limited. High speed exposure time control means for focal plane shutters. 4,044,368, Cl. 354-267.000.

Inoue, Shozo; and Sato, Tadashi, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member. 4,043,658, Cl. 355-10.000.

Inskip, Harold Kirkwood: *See—*
Beresniewicz, Aleksander; and Inskip, Harold Kirkwood, 4,043,961, Cl. 260-29.6WA.

Institut Francais du Petrole: *See—*
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Intel Corporation: *See—*
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Interior Mill Equipment Ltd.: *See—*
Johnson, Raymond A.; Lum, John M.; and Kazakoff, Mike, 4,043,491, Cl. 222-503.000.

International Business Machines Corporation: *See—*
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Ferraiolo, Frank A.; and Griess, Roy K., 4,044,295, Cl. 363-54.000.
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Garofalo, Frank John, Jr.; and Pardonner, George Nathan, Jr., 4,044,331, Cl. 364-900.000.
Hicks, Glen LeRoy; Howe, Leland Delmar, Jr.; and Zurla, Frank Anthony, Jr., 4,044,337, Cl. 364-200.000.
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Van Voorhis, David Curtis, 4,044,347, Cl. 340-347.0DD.

International Computers Limited: *See—*
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International Flavors & Fragrances Inc.: *See—*
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International Harvester Company: *See—*
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Zitko, Ronald F.; and Adams, James R., 4,043,258, Cl. 98-121.00A.

International Minerals & Chemical Corporation: *See—*
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International Nickel Company, Inc., The: *See—*
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Portnoy, Norman A., 4,044,090, Cl. 264-187.000.
Spangler, Paul Joseph, 4,043,032, Cl. 29-628.000.
Wolfson, Ronald I.; and Sanders, Bobby J., 4,044,360, Cl. 343-754.000.

InterRoyal Corporation: *See—*
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IRD Mechanalysis, Inc.: *See—*
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Ireland, Henry R.; and Stein, Thomas R., to Mobil Oil Corporation. Method for altering the product distribution of water washed, Fischer-Tropsch synthesis hydrocarbon product to improve gasoline octane and diesel fuel yield. 4,044,063, Cl. 260-676.00R.

Irick, Gether, Jr.: *See—*
Wang, Richard H. S.; and Irick, Gether, Jr., 4,043,973, Cl. 260-45.8NT.

Irion, Leonhard; Tautz, Jurgen; and Ulrych, Gerhard, to Kraftwerk Union Aktiengesellschaft. Water-cooled nuclear reactor with loss-of-coolant protection. 4,043,868, Cl. 176-50.000.

Ironees Company, The: *See—*
Lehrman, David, 4,043,062, Cl. 38-140.000.

Irradiated Strings, Inc.: *See—*
Conn, Bartley Russell, 4,043,555, Cl. 273-73.00D.

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Hari, Stefan; Irvine, Alexander McHugh; McCrae, James McGeachie; Vuitel, Laurent; and L'Eplattenier, Francois, 4,044,036, Cl. 260-438.100.

Isaacs, Hugh S.; and Romano, Anthony J., to United States of America, Energy Research and Development Administration. Device for measuring the total concentration of oxygen in gases. 4,043,890, Cl. 204-195.00S.

Isenberg, Don Eugene; Parker, Irvin Lee, Jr.; and Zelenski, Paul Allen, to Koppers Company, Inc. Continuous casting starting bar and stowage thereof. 4,043,383, Cl. 164-274.000.

Ishibashi, Tadashi: *See—*
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Ishida, Kinyu; Gose, Kenji; Matsunami, Shigeo; Sigeoka, Miyoyuki; and Matsumura, Teruichi, to Teijin Limited; and Teijin Seiki Co., Ltd. Apparatus for packaging a plurality of yarn packages in a cardboard box or a like container. 4,043,097, Cl. 53-52.000.

Ishikawa, Soji. Needle holder device of medical administrating injector. 4,043,335, Cl. 128-218.00N.

Ishizumi, Kikuo; Mori, Kazuo; Okamoto, Tadashi; Akase, Takeshi; Izumi, Takahiro; Akatsu, Mitsuhiro; Kume, Yoshiharu; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Process for preparing 1,4-benzodiazepines. 4,044,003, Cl. 260-239.0BD.

Ismer, Walter. Reinforced and ventilated seats. 4,043,544, Cl. 267-83.000.

Italsider S.p.A.: *See—*
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Itek Corporation: *See—*
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Itier, Jean Joseph: *See—*
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J. Sklar Mfg. Co., Inc.: *See—*
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Jager, Horst, to Ciba-Geigy Corporation. Dialkylphosphonopropionic acid amides and process for their manufacture. 4,044,075, Cl. 260-943.000.

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Jariwala, Praveen K., to Westinghouse Electric Corporation. Electron gun cathode heater filament electrical connection and support system. 4,044,278, Cl. 313-417.000.

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Jeffery, Edwin A.; and Hinlein, Sigmund, to Data General Corporation. Scanning polygon with adjustable mirrors. 4,043,632, Cl. 350-7.000.

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Jenkins, Thomas E.; and Herbst, LeRoy J., to General Electric Company. Protective circuit for dishwasher heating element. 4,044,224, Cl. 219-322.000.

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Jensen, Donald D. Exhaust hood. 4,043,319, Cl. 126-299.00D.

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John Wyeth & Brother Limited: *See—*
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Johnson, John R., to Royal Industries, Inc. Mobile pump. 4,043,441, Cl. 198-317.000.

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Perfect, Alan J., 4,043,042, Cl. 32-40.00R.

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Johnson, Raymond A.; Lum, John M.; and Kazakoff, Mike, to Interior Mill Equipment Ltd. Hopper bin. 4,043,491, Cl. 222-503.000.

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Jones, Emyr, to Clarke Chapman Limited. Friction welding machine. 4,043,496, Cl. 228-2.000.

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Jones, William Clifford, Jr.; and Long, Robert E., to General Steel Industries, Inc. Railway locomotive trucks. 4,043,272, Cl. 105-136.000.

Jones, William R., to Celotex Corporation, The. Apparatus for producing rigid foam plastic laminated board. 4,043,719, Cl. 425-115.000.

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Kabushiki Kaisha Kawaguchiya Hayashi Juho Kayaku-Ten: *See*—
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Kessler, Milton; and Ullman, Myron E., Jr., 4,043,278, Cl. 108-150.000.

Kessler, Thomas Jacob: *See—*
Alkire, Richard Collin; Engelmaier, Werner; and Kessler, Thomas Jacob, 4,043,891, Cl. 204-231.000.

Kestenbaum, Ami, to Western Electric Company, Inc. Method of forming tapered apertures in thin films with an energy beam. 4,044,222, Cl. 219-121.0LM.

Keuffel & Esser Company: *See—*
Levinos, Steven, 4,043,879, Cl. 204-18.0PC.

Khan, Tasadduq: *See—*
Bibring, Herve; Trottier, Jean-Pierre; Khan, Tasadduq; Rabinovitch, Maurice; and Stohr, Jean-Francois, 4,043,841, Cl. 148-32.500.

Khoury, Nick S., to Continental Group, Inc., The. Front opening easy-opening end closure with vent. 4,043,479, Cl. 220-271.000.

Kienzle, Frank; and Rosen, Perry, to Hoffmann-La Roche Inc. Peroxides of 2-oxo-cyclopenta[b]furans. 4,044,005, Cl. 542-426.000.

Kienzle Uhrenfabriken GmbH: *See—*
Haag, Albrecht; and Siefert, Roland, 4,043,118, Cl. 58-152.00R.

Kikuchi, Kimio: *See—*
Endo, Masaaki; Miura, Mitsuo; Kukino, Yoshinori; Kikuchi, Kimio; and Aoyagi, Hayao, 4,043,909, Cl. 210-49.000.

Kikuchi, Mitsuo; and Hiraga, Yoichi, to Toyo Soda Manufacturing Co., Ltd. Process for removing organic material from wet process phosphoric acid. 4,044,108, Cl. 423-321.00R.

Kilmurry, Lindsay; and Urion, Howard Kirby, to Du Pont de Nemours, E. I., and Company. Phenylazoaminophenylpyrazole acid dye solutions containing two nonionic surfactants. 4,043,752, Cl. 8-41.00B.

Kimberly-Clark Corporation: *See—*
Appel, David W., 4,043,739, Cl. 425-461.000.

Kimura, Hiroshi: *See—*
Kisuna, Keiichi; Toyama, Satoru; and Kimura, Hiroshi, 4,043,022, Cl. 29-460.000.

Kindlimann, Lynn E.: *See—*
Hartline, Albert G., III; and Kindlimann, Lynn E., 4,043,839, Cl. 148-20.300.

Kinney, Dwayne R., to International Telephone and Telegraph Corporation. Push-button sensor switch. 4,044,213, Cl. 200-308.000.

Kioritz Corporation: *See—*
Okamoto, Tatsuo; Nogawa, Masat; and Okabe, Nobuyoshi, 4,043,037, Cl. 30-276.000.

Kirchner, Russell W.: *See—*
Acuncius, Dennis A.; Herchenroeder, Robert B.; Kirchner, Russell W.; and Silence, William L., 4,043,810, Cl. 75-171.000.

Kirman, Ivor, to International Nickel Company, Inc., The. Alloy steels. 4,043,807, Cl. 75-125.000.

Kishimoto, Jyuji; and Toyomura, Shigeru, to Canon Kabushiki Kaisha. Electronic calculator with printer. 4,044,228, Cl. 235-61.90A.

Kiss, Joseph; and Berg, Klaus Peter, to Hoffmann-La Roche Inc. Halogen derivatives of ascorbic acid and D-araboascorbic acid antioxidants. 4,043,937, Cl. 252-407.000.

Kisuna, Keiichi; Toyama, Satoru; and Kimura, Hiroshi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Method of manufacturing double-structure sound absorbing wall for motor vehicle. 4,043,022, Cl. 29-460.000.

Kitamura, Taketsugu: *See—*
Hisamatsu, Tokuichi; Kitamura, Taketsugu; Saito, Takeshiro; Takagi, Hitoshi; and Sekiya, Takuzo, 4,044,101, Cl. 423-235.000.

Kito, Hidetoshi: *See—*
Seki, Masao; Kito, Hidetoshi; and Yoshino, Masaki, 4,043,233, Cl. 83-23.000.

Kitzing, Rainer; and Smith, Norman Alfred, to Ciba-Geigy AG. Process for crosslinking hydrophilic colloids. 4,043,995, Cl. 260-117.000.

Kivikari, Riitta Helena Kristiina: *See—*
Johansson, Ake Allan; Kivikari, Riitta Helena Kristiina; and Suokas, Elias Uolevi, 4,044,031, Cl. 260-397.250.

Kivnick, Arnold: *See—*
Bierker, George John; and Kivnick, Arnold, 4,043,886, Cl. 204-157.10R.

Klarman, Casimir M.: *See—*
Miller, Lewis J.; and Klarman, Casimir M., 4,043,615, Cl. 308-32.000.

Klaus-Gerd Hoes, Firma: *See—*
Hoes, Klaus Gerd; and Wobken, Gerold, 4,043,135, Cl. 61-72.500.

Kleiman, Joseph P., to Ethyl Corporation. Preparation of bromine. 4,044,113, Cl. 423-500.000.

Klein, Guenter Peter: *See—*
Rajakovics, Gundolf E.; Gabernig, Heinz; and Klein, Guenter Peter, 4,043,875, Cl. 203-82.000.

Klein, Schanzlin & Becker Aktiengesellschaft: *See—*
Heumann, Anton; and Weibart, Heinz, 4,043,707, Cl. 417-360.000.

Kleinewefers Industrie-Companie GmbH: *See—*
Schiffer, Gunter, 4,043,157, Cl. 68-5.00E.

Kleist, Earl F., to Allis-Chalmers Corporation. Brake pedal. 4,043,217, Cl. 74-470.000.

Klotz, Michael C.; and Mei, Viung C., to Dole Refrigerating Company. Hot gas defrost system. 4,043,144, Cl. 62-277.000.

Klymus, Stephane. Method of making printing plates for offset printing. 4,043,815, Cl. 96-33.000.

KMS Fusion, Inc.: *See—*
Siebert, Larry D., 4,043,635, Cl. 350-160.00R.
Sigler, Robert D., 4,043,643, Cl. 350-200.000.

Knapp, Philip B. Universal drive joint. 4,043,148, Cl. 64-17.00R.

Kneubuhler, Werner: *See—*
Koller, Stefan; Karlen, Urs; Kneubuhler, Werner; and Defago, Raymond, 4,044,029, Cl. 260-376.000.

Knight, Clifford: *See—*
Phillips, Kenneth G.; Walford, Richard P.; and Knight, Clifford, 4,043,550, Cl. 271-233.000.

Knoche, Hubert Wilhelm: *See—*
Bernard, Jean Rene; Brunel, Daniel Elie; Commeyras, Auguste Andre; Coste, Camille Michel; Itier, Jean Joseph; and Knoche, Hubert Wilhelm, 4,044,069, Cl. 260-683.470.

Knoll, Herbert: *See—*
Reif, Hans-Heinrich; Wehner, Klaus; Welker, Jurgen; Schmidt, Karl-Heinz; Schnick, Waltraud; Widmann, Lutz; Schicker, Otto; Seidel, Gunter; Kalb, Karsten; Dollase, Wolfhard; Furtig, Helmut; Hose, Werner; Roscher, Wolfgang; Hadicke, Udo; Knoll, Herbert; Seidel, Rudiger; Nemitz, Gunter; Sturmer, Edith; and Kaiser, Manfred, 4,043,938, Cl. 252-412.000.

Knox, J. Paul: *See—*
Dyche, Kenneth I.; Knox, J. Paul; and Swearengin, Ronald I., 4,043,078, Cl. 49-220.000.

Knuth, Eugene W. Removable cutting elements. 4,043,367, Cl. 145-31.00R.

Ko, Su Sen, to Minnesota Mining and Manufacturing Company. Hair spray containing fluorocarbon compounds as additives. 4,044,121, Cl. 424-71.000.

Kobatake, Tatsuo: *See—*
Saito, Katashi; Matsumoto, Toshio; Hasebe, Nobuhisa; and Kobatake, Tatsuo, 4,043,382, Cl. 164-76.000.

Kobayashi, Tatsuhiko: *See—*
Ashida, Kaneyoshi; Ohtani, Masaaki; Ichii, Makoto; and Kobayashi, Tatsuhiko, 4,044,184, Cl. 428-113.000.

Kobe Steel, Limited: *See—*
Furuta, Isao; Tamura, Hiroshi; and Takao, Masami, 4,044,111, Cl. 423-351.000.

Koch-Light Laboratories, Ltd.: *See—*
Barker, Sidney Alan; and Gray, Charles John, 4,043,869, Cl. 195-63.000.

Kochel, Leroy Joseph, to Sperry Rand Corporation. Method of and apparatus for the radio frequency sputtering of a thin film. 4,043,889, Cl. 204-192.00R.

Koehring Company: *See—*
Nelson, Albert W., 4,043,402, Cl. 172-112.000.

Koehring GmbH: *See—*
Kuhn, Hans, 4,043,405, Cl. 173-127.000.

Kohisa, Toshihiko: *See—*
Nomiya, Kosei; Kohisa, Toshihiko; and Matsumura, Isao, 4,044,373, Cl. 357-41.000.

Koike, Yoshiyasu; Shiraki, Hachio; Suzuki, Eigen; and Yoshida,

Makoto, to Showa Electric Wire and Cable Company. Method of fabricating composite superconductors. 4,043,028, Cl. 29-599.000.
Koizumi, Eiji, to Kameda Seika Co., Ltd. Expanded board or sheet-like food product and method of manufacturing the same. 4,044,166, Cl. 426-560.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Yokoi, Hiroshi; and Akagawa, Masataka, 4,044,361, Cl. 343-754.000.
Kolb, David L., to Caterpillar Tractor Co. Adjustable controls of a work vehicle. 4,043,220, Cl. 74-543.000.
Koller, Stefan; Karlen, Urs; Kneubuhler, Werner; and Defago, Raymond, to Ciba-Geigy AG. Amino-anthraquinone reactive disperse dyes. 4,044,029, Cl. 260-376.000.
Komet Stahlhalter- und Werkzeugfabrik, Robert Breuning GmbH: *See*—
Eckle, Otto, 4,043,697, Cl. 408-182.000.
Komiya, Osamu, to Olympus Optical Co., Ltd. Medical instrument attached to an endoscope. 4,043,323, Cl. 128-4.000.
Kommanditbolaget Kockums Chemical AB & Co.: *See*—
Blixt, Kjell Gunnar; Tornmarck, Sven Ivan Arvid; Juhlin, Rolf; Salenstedt, Karl Rune; and Tiru, Mandayam, 4,043,871, Cl. 195-99.000.
Kommanditgesellschaft Warmetechnik B. Ruthenberg GmbH: *See*—
Kuhn, Gerald, 4,044,221, Cl. 219-217.000.
Komyati, William J., to General Electric Company. Mechanically assembled base for electric lamps. 4,044,277, Cl. 313-318.000.
Kondo, Osamu; Hashimoto, Torao; and Hasegawa, Hajime, to Bridgestone Tire Company Limited. Method for recovering polyol from a polyurethane. 4,044,046, Cl. 260-471.00C.
Kondo, Toshihiro, to Toshihiro Kondo; and Fuji Photo Film Co., Ltd. Photographic camera with density-variable filter. 4,044,370, Cl. 354-289.000.
Konishi, Hiromu; Horie, Mitsuyuki; and Toda, Tadahide, to Toyota Jidosha Kogyo Kabushiki Kaisha. Negative pressure generating system for internal combustion engine powered vehicles. 4,043,123, Cl. 60-397.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Machida, Masaaki, 4,043,667, Cl. 355-97.000.
Konucik, George J.; Robertson, Thomas B.; and Davis, Robert. Super frog gig. 4,043,067, Cl. 43-6.000.
Koppel, Gary A., to Eli Lilly and Company. Substituted β-lactam antibiotics. 4,044,000, Cl. 260-239.100.
Koppers Company, Inc.: *See*—
Isenberg, Don Eugene; Parker, Irvin Lee, Jr.; and Zelenski, Paul Allen, 4,043,383, Cl. 164-274.000.
Korous, Donald J.; and Neuzil, Richard W., to Universal Oil Products Company. Hydrocarbon separation. 4,044,062, Cl. 260-674.0SA.
Koser, Rolf, to Sidro KG Ludwig Moller Fabrik fur Rohrbogen. Process and machine for finishing a 15° to 180° pipe bend which has been preformed on a pipe bending press. 4,043,167, Cl. 72-340.000.
Kostrzewa, Michael; Holst, Arno; and Buchberger, Gerhard, to Hoechst Aktiengesellschaft. Method for cold-milling cellulose derivatives. 4,044,198, Cl. 536-86.000.
Kotzsch, Han-Joachim; Vahlensieck, Hans-Joachim; and Josten, Walter, to Dynamit Nobel Aktiengesellschaft. Process for the hydrochlorination of elemental silicon. 4,044,109, Cl. 423-342.000.
Koury, Frederic: *See*—
Keeffe, William M.; and Koury, Frederic, 4,044,276, Cl. 313-218.000.
Kovacs, Laszlo: *See*—
Erodi, Gyorgy; Gorondi, Istvan; Kovacs, Laszlo; and Takacs, Gyorgy, 4,043,170, Cl. 72-364.000.
Kovarik, James C.: *See*—
Applebaum, Sidney P.; Howells, Paul W.; and Kovarik, James C., 4,044,359, Cl. 343-100.0LE.
Koyama, Masaharu: *See*—
Matsuyama, Sigeru; Tanaka, Hironari; Koyama, Masaharu; and Ishibashi, Tadashi, 4,043,639, Cl. 350-160.0LC.
Kozlov, Jury Georgievich; and Lopatin, Alexandr Iosifovich. Spectrometer and method of examining spectral composition of light. 4,043,670, Cl. 356-106.00S.
Kraft, Joseph K.; Sette, Robert A.; and Jackson, Leigh F., to Westinghouse Electric Corporation. Elevator system having common enclosure for open wiring between door controls, car top inspection station controls and traveling cable. 4,043,430, Cl. 187-52.00R.
Kraft, Wolfgang; and Blossfeld, Lothar, to ITT Industries, Inc. Planar diffusion method for an I^2L circuit including a bipolar analog circuit part. 4,043,849, Cl. 148-187.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Heitmann, Hans-Gunther, 4,043,864, Cl. 176-37.000.
Irion, Leonhard; Tautz, Jurgen; and Ulrych, Gerhard, 4,043,868, Cl. 176-50.000.
Krall, Thomas J.: *See*—
Dybala, Ambrose B.; Krall, Thomas J.; and Uhlig, Albert R., 4,043,734, Cl. 425-532.000.
Kramann, Bernhard; and Tammen, Heinrich, to Byk Gulden Lomberg Chemische Fabrik GmbH. Catheter. 4,043,345, Cl. 128-349.00R.
Krasser, Fritz; Heydner, Konrad; and Ellenberger, Horst, to Ellenberger & Poensgen GmbH. Pushbutton actuated excess current switch. 4,044,325, Cl. 337-66.000.
Kratzmann, Helmut; Heinik, Josef; Obermaier, Robert; Zentner, Erich; and Redinger, Robert, to Hoechst Aktiengesellschaft. Calender with nip boundary plates. 4,043,731, Cl. 425-366.000.
Kreb, Robert J., III. Sterile syringe device. 4,043,336, Cl. 128-218.00R.
Kreighbaum, William E.; and Roth, Herbert R., to Mead Johnson & Company. Antihypertensive 4'-[1-hydroxy-2-[(1-phenoxy ethyl)-amino]ethyl]methanesulfonanilide and salts thereof and therapeutic use. 4,044,150, Cl. 424-321.000.
Kremkau, William P., to W. R. Grace & Co. Film laminates having a reirradiated layer. 4,044,187, Cl. 428-212.000.
Krenzer, John, to Velsicol Chemical Corporation. Thiadiazolyl and cycloimino imidazolidinones. 4,043,795, Cl. 71-90.000.
Kress, Paul Joseph; and Plepys, Raymond A., to Dow Chemical Company, The. Aqueous dispersions of thermosetting hydroxy-functional formaldehyde copolymer resins derived from diaryl oxides, sulfides, dibenzofuran or dibenzothiophene. 4,043,960, Cl. 260-29.40R.
Kreuzer, Lloyd B., to Diax Corporation. Retention time chromatograph employing an IR absorption spectrographic detector. 4,044,257, Cl. 250-344.000.
Krisch, Burkhard; and Rauch, Moriz V., to Siemens Aktiengesellschaft. Scanning corpuscular-beam transmission type microscope including a beam energy analyzer. 4,044,254, Cl. 250-311.000.
Krisch, Burkhard; and Rauch, Moriz V., to Siemens Aktiengesellschaft. Corpuscular-beam transmission-type microscope including an improved beam deflection system. 4,044,255, Cl. 250-311.000.
Krisch, Burkhard; Muller, Karl-Heinz; Rauch, Moriz von; and Veneklasen, Lee H., to Siemens Aktiengesellschaft. Support stand for a corpuscular-beam microscope. 4,044,256, Cl. 250-311.000.
Krohn, Antonin: *See*—
Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,044,017, Cl. 260-295.0AM.
Krueger, Friedrich; and Palleduhn, Dieter, to Joh. A. Benckiser GmbH. 1,4-Bis-formyl cyclohexane polycarboxylic acids, process of making same, and compositions and methods of using same. 4,043,930, Cl. 252-89.00R.
Krug, Aribert: *See*—
Hartmann, Job-Werner; Falk, Roland; Krug, Aribert; Huber, Georg; Balz, Werner; and Mahler, Karl, 4,043,297, Cl. 118-640.000.
Krumkalns, Eriks V., to Eli Lilly and Company. Method of regulating the growth of aquatic weeds with pyridine derivatives. 4,043,790, Cl. 71-66.000.
Krumkalns, Eriks V., to Eli Lilly and Company. Method of regulating the growth of aquatic weeds with pyridine derivatives. 4,043,791, Cl. 71-66.000.
Kubersky, Hans Peter; and Weinrich, Erwin, to Henkel & Cie GmbH. Developer-coupler hair dyes based on triamino-pyrimidinones. 4,043,750, Cl. 8-10.200.
Kubik, Philip A. Fluid system. 4,043,125, Cl. 60-406.000.
Kubik, Philip A. Reservoir housing. 4,043,127, Cl. 60-453.000.
Kubo, Masanobu: *See*—
Sakamoto, Eiichi; Kubo, Masanobu; Yasui, Takashi; Suzuki, Katsuya; and Tachibana, Katsuhiko, 4,043,801, Cl. 75-60.000.
Kubota, Kanemitsu: *See*—
Akahane, Masao; Hosokawa, Minoru; and Kubota, Kanemitsu, 4,044,346, Cl. 340-336.000.
Kuchuk-Yatsenko, Sergei Ivanovich: *See*—
Lebedev, Vladimir Konstantinovich; Chernenko, Ivan Alexeevich; Postolaty, Nikolai Ivanovich; Kuchuk-Yatsenko, Sergei Ivanovich; Tishura, Vladimir Ivanovich; Entin, Yakov Borisovich; Filippov, Alexandr Nikolaevich; and Martynov, Evgeny Petrovich, 4,044,219, Cl. 219-100.000.
Kudchadker, Mohan Vaikunth; and Walker, Thad Oscar, to Texaco Inc. Alkoxylated asphalt as sacrificial agents in oil recovery processes. 4,043,396, Cl. 166-274.000.
Kugler, Jorg: *See*—
Mahn, Gustav; Schoop, Josef; and Kugler, Jorg, 4,043,800, Cl. 75-60.000.
Kuhl, Thomas J.: *See*—
Rowlson, Peter C.; and Kuhl, Thomas J., 4,043,012, Cl. 29-105.00R.
Kuhla, Donald E., to Pfizer Inc. Imidazopyridinium compounds as hypoglycemic agents. 4,044,015, Cl. 260-294.80C.
Kuhn, Gerald, to Kommanditgesellschaft Warmetechnik B. Ruthenberg GmbH. Flexible heating element for heating seats, in particular motor vehicle seats, couches, berths or the like. 4,044,221, Cl. 219-217.000.
Kuhn, Hans, to Koehring GmbH. Pile-driving arrangement. 4,043,405, Cl. 173-127.000.
Kukino, Yoshinori: *See*—
Endo, Masaaki; Miura, Mitsuo; Kukino, Yoshinori; Kikuchi, Kimio; and Aoyagi, Hayao, 4,043,909, Cl. 210-49.000.
Kume, Yoshiharu: *See*—
Ishizumi, Kikuo; Mori, Kazuo; Okamoto, Tadashi; Akase, Takeshi; Izumi, Takahiro; Akatsu, Mitsuhiro; Kume, Yoshiharu; Inaba, Shigeho; and Yamamoto, Hisao, 4,044,003, Cl. 260-239.0BD.
Kunde, Joachim: *See*—
Wurmb, Rolf; Kunde, Joachim; Schlag, Johannes; and Dorst, Hans Georg, 4,043,971, Cl. 260-40.00R.
Kurashiki Boseki Kabushiki Kaisha: *See*—
Kasaoka, Shigeaki, 4,043,939, Cl. 252-416.000.
Muraki, Ryoji; Endo, Masao; Aoki, Nobuaki; and Takeshita, Masahiro, 4,044,102, Cl. 423-239.000.
Kuris, Arthur. Ultrasonic perspective carving. 4,043,084, Cl. 51-318.000.
Kurita, Masayuki: *See*—
Yoshikawa, Toshio; Sakamoto, Nagayoshi; Kurita, Masayuki; Oh-e, Shunji; and Nagamori, Lomitado, 4,043,976, Cl. 260-45.80N.
Kurkov, Victor P., to Chevron Research Company. Isomerization of propenyl esters. 4,044,050, Cl. 260-491.000.
Kurtz, Bruce E., to Allied Chemical Corporation. Process and appara-

tus for autothermic cracking of ethane to ethylene. 4,044,068, Cl. 260-683.300.

Kushlefsky, Bernard G.: *See*—
Treadwell, Kenneth; Kushlefsky, Bernard G.; and Russo, Robert V., 4,043,949, Cl. 260-2.5AC.

Kusters, Eduard: *See*—
Ahrweiler, Karl-Heinz, 4,043,732, Cl. 425-371.000.

Kuwada, Yutaka; Meguro, Kanji; Natsugari, Hideaki; Sato, Yoshiaki; and Tawada, Hiroyuki, to Takeda Chemical Industries, Ltd. 4-Pyridine carbonyl phenyl 1,2,4 triazoles. 4,044,129, Cl. 424-248.560.

Kuwana, Toshitsugu, to Rank Xerox Ltd. Interlinear feeder for copying machine. 4,043,664, Cl. 355-75.000.

Kuzunuki, Soshiro: *See*—
Hirasawa, Kotaro; Kuzunuki, Soshiro; Iwasaka, Tatsuo; and Kaneko, Takashi, 4,043,429, Cl. 187-29.00R.

Kwan, Jonathan: *See*—
Yen, Teh Fu; Wen, Chaur-Shyong; and Kwan, Jonathan, 4,043,885, Cl. 204-131.000.

Kyburz, Emilio: *See*—
Gerecke, Max; Kaplan, Jean-Pierre; and Kyburz, Emilio, 4,044,010, Cl. 260-268.0TR.

Kyncl, Jaroslav: *See*—
Winn, Martin; Kyncl, Jaroslav; Dunnigan, Daniel Ambrose; and Jones, Peter Handley, 4,044,135, Cl. 424-251.000.

Kyokado Engineering Co., Ltd.: *See*—
Suzuki, Manao, 4,043,830, Cl. 106-287.0SS.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Fujimoto, Yasuo; and Nakamizo, Nobuhiro, 4,043,992, Cl. 260-112.50R.

L.C.P. Group Services Limited: *See*—
Turner, Harold Roy, 4,043,593, Cl. 297-341.000.

L. & C. Steinmuller GmbH: *See*—
Plura, Georg, 4,043,833, Cl. 134-34.000.

Labana, Santokh S.; and Theodore, Ares N., to Ford Motor Company. Powder paint blends of an epoxy and hydroxy-functional copolymer and a carboxy-terminated copolymer. 4,044,070, Cl. 260-836.000.

Lacroix, Bernard, to Cycles Peugeot. Handle-bar stem. 4,043,684, Cl. 403-8.000.

Lacroix, Laurent, to Rhone-Poulenc Industries. Fungicidal compositions. 4,044,145, Cl. 424-273.00R.

Laesser, Claude, to Ebauches S.A. Data selection and display arrangement for a small device. 4,044,242, Cl. 235-152.000.

Lafferty, William Daniel; Smith, James Thomas; and Rench, Nicholas Wayne, to GTE Sylvania Incorporated. Apparatus for providing a stream of molten metal from a metallic ingot. 4,043,716, Cl. 425-6.000.

Lahr, Fred H.; and Murley, Roger W., to Rockwell International Corporation. Edger-trimmer head indexing mechanism. 4,043,101, Cl. 56-17.100.

Lakin, George W.; and Lakin, Robert L. Lawn edger accessory. 4,043,103, Cl. 56-295.000.

Lakin, Robert L.: *See*—
Lakin, George W.; and Lakin, Robert L., 4,043,103, Cl. 56-295.000.

Lallement, Jean: *See*—
Benque, Jean-Pierre; Lallement, Jean; and Lambert, Paul, 4,043,867, Cl. 176-40.000.

Lambert, Paul: *See*—
Benque, Jean-Pierre; Lallement, Jean; and Lambert, Paul, 4,043,867, Cl. 176-40.000.

Lamothe, Aime, to Raymond Lee Organization, Inc., The. Ice fishing rod. 4,043,070, Cl. 43-21.200.

Lamp, Thomas R., to Hughes Aircraft Company. Water heat pipe with improved compatability. 4,043,387, Cl. 165-105.000.

Lampert, Ingolf: *See*—
Jacob, Herbert; and Lampert, Ingolf, 4,043,861, Cl. 156-636.000.

Land-O-Tackle: *See*—
Lando, Joseph A., 4,043,071, Cl. 43-23.000.

Landau, Raphael, to Ozalid Group Holdings, Limited. Ink containing iron chelate and polyhydroxy compound. 4,043,820, Cl. 106-21.000.

Landi, Henry Patrick; and Perciaccante, Vincent Anthony, to American Cyanamid Company. Non-absorbable surgical sutures coated with polyoxyethylene-polyoxypropylene copolymer lubricant. 4,043,344, Cl. 128-335.500.

Lando, Frank; and Teitelbaum, Charles Leonard, to General Foods Corporation. Decaffeinated coffee of improved flavor. 4,044,162, Cl. 426-427.000.

Lando, Joseph A., to Land-O-Tackle. Fishing rod assembly. 4,043,071, Cl. 43-23.000.

Langley, Thomas W.: *See*—
Morris, David A.; Flournoy, Norman E.; and Langley, Thomas W., 4,043,180, Cl. 73-40.50A.

Lanoux, Sigred Boyd: *See*—
Davis, John Maxwell; and Lanoux, Sigred Boyd, 4,043,974, Cl. 260-45.75C.

Lapes, Rubin, to Hollingsead-Pryor Enterprises. Electrical terminal structure for connector. 4,043,631, Cl. 339-252.00R.

LaPour, Robert H.; and Liefbroer, Harold G. Open-fire rotisserie stand. 4,043,260, Cl. 99-421.0HH.

Lappa, Cleto L. Wheel rolling game. 4,043,556, Cl. 273-86.00R.

Larco Societe Miniere et Metallurgique de Larymna S.A.: *See*—
Tsirigotis, Constantin, 4,043,758, Cl. 23-262.000.

Largman, Theodore; and Sifniades, Stylianos, to Allied Chemical Corporation. Process for preparing α-chloro-ε-caprolactam. 4,044,001, Cl. 260-239.30R.

Larrabee, Edward Whittum; Rawson, Paul Olney; and Yagami, Richard Hajime, to Union Carbide Corporation. Portable liquid package container for use with blood washing device. 4,043,501, Cl. 229-14.0BE.

Larsen, Edgar Robert: *See*—
Rayburn, Donald Lee; Sunday, Larry Ray; and Larsen, Edgar Robert, 4,044,214, Cl. 200-316.000.

Larson, Bernard J.; Johnson, Oliver Wendell; and Yip, James Kwok-fun, to Eaton Corporation. Load sensing power steering system. 4,043,419, Cl. 180-132.000.

Larson, Robert A.: *See*—
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Lussenden, Delbert. Method and apparatus for drying grain. 4,043,051, Cl. 34-77.000.
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Macy, Robert L.; and Zupanick, Joseph E., to Suntech, Inc. Parallelogram structure. 4,042,991, Cl. 14-1.000.
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Comer, William T.; and Catt, John D., 4,044,151, Cl. 424-321.000.
Kreighbaum, William E.; and Roth, Herbert R., 4,044,150, Cl. 424-321.000.
Meares, Claude F.; and Sundberg, Michael W., to Leland Stanford Junior University, The Board of Trustees of the. 1-(P-benzenediazonium)-ethylenediamine tetraacetic acid. 4,043,998, Cl. 260-141.000.
Medinsky, Nikolai Ivanovich: *See*—
Romanenko, Nikolai Trofimovich; Chichin, Alexandr Vasilievich; Lyaskovsky, Ivan Frantsevich; Melnik, Vladimir Jurievich; Medinsky, Nikolai Ivanovich; and Yakunin, Valentin Matveevich, 4,043,211, Cl. 74-110.000.
Meguro, Kanji: *See*—
Kuwada, Yutaka; Meguro, Kanji; Natsugari, Hideaki; Sato, Yoshiaki; and Tawada, Hiroyuki, 4,044,129, Cl. 424-248.560.
Mehta, Nariman Bomanshaw; and Brieaddy, Lawrence Edward, to

Burroughs Wellcome Co. Sulfide compounds. 4,044,014, Cl. 260-293.730.
Mei, Viung C.: *See*—
Klotz, Michael C.; and Mei, Viung C., 4,043,144, Cl. 62-277.000.
Melachouris, Nicholas, to Stauffer Chemical Company. Process for the recovery of whey protein having improved solution clarity using polyphosphates. 4,043,990, Cl. 260-112.00R.
Melco: *See*—
Champan, Louis W.; and Perkins, Arthur T., 4,044,206, Cl. 179-84.0VF.
Melnick, Joseph L.; and Wallis, Craig, to Baylor College of Medicine. Sterilization of holding tanks and toilet bowls by quaternary compounds. 4,043,911, Cl. 210-62.000.
Melnik, Vladimir Jurievich: *See*—
Romanenko, Nikolai Trofimovich; Chichin, Alexandr Vasilievich; Lyaskovsky, Ivan Frantsevich; Melnik, Vladimir Jurievich; Medinsky, Nikolai Ivanovich; and Yakunin, Valentin Matveevich, 4,043,211, Cl. 74-110.000.
Mercer, Howard Alexander, to Akzona Incorporated. Device for adjusting strand carrier tube in composite yarn producing apparatus. 4,043,720, Cl. 425-113.000.
Merck & Co., Inc.: *See*—
Remy, David C., 4,044,143, Cl. 424-267.000.
Rogers, Edward F.; Hannah, John; and Dybas, Richard A., 4,044,133, Cl. 424-251.000.
Ruyle, William V.; Sarett, Lewis H.; and Matzuk, Alexander R., 4,044,049, Cl. 260-479.00R.
Schultz, Everett M.; and Cragoe, Edward J., Jr., 4,044,153, Cl. 424-330.000.
Mercury Machine Co.: *See*—
Petrenchik, John R., 4,043,385, Cl. 164-342.000.
Merelli, Marc: *See*—
Allain, Jacques; Duchene, Jean; and Merelli, Marc, 4,044,301, Cl. 324-33.000.
Merkle, Eberhard, to Wilh. Bleyle KG. Spool rack. 4,043,154, Cl. 66-125.00R.
Merlo, Michele. Miniaturized precision speed gyroscope. 4,043,205, Cl. 74-5.500.
Mesaros, Louis: *See*—
Mollard, Paul; and Mesaros, Louis, 4,044,103, Cl. 423-267.000.
Mesle, Reinhold: *See*—
Leibinger, Paul; Mesle, Reinhold; Methner, Arnold; and Steidle, Alfons, 4,044,215, Cl. 200-318.000.
Messerschmitt-Bolkow-Blohm GmbH: *See*—
Held, Manfred, 4,043,266, Cl. 102-24.0HC.
Metallgesellschaft Aktiengesellschaft: *See*—
Peschel, Dieter; and Funke, Dieter, 4,043,221, Cl. 74-573.00R.
Metallprodukte A.G. Grenchen: *See*—
Schlappi, Hans, 4,043,116, Cl. 58-88.00R.
Metallurgie Hoboken-Overpelt: *See*—
Leroy, Jean, 4,043,166, Cl. 72-39.000.
Metcalf, Harold J., to Blumberg, Nathan; Public Systems Research, Inc.; and Metcalf, Harold J., part interest to each. Constant flow rate liquid medicament administering device. 4,043,332, Cl. 128-214.00E.
Methner, Arnold: *See*—
Leibinger, Paul; Mesle, Reinhold; Methner, Arnold; and Steidle, Alfons, 4,044,215, Cl. 200-318.000.
Mettler Instrumente AG: *See*—
Luchinger, Paul, 4,043,415, Cl. 177-255.000.
Stutz, Andreas, 4,043,414, Cl. 177-248.000.
Metzger, Lenard M., to Eastman Kodak Company. Interactive servo control system for use with a rotating-head magnetic tape player. 4,044,388, Cl. 360-70.000.
Meyer, Engelbert A., to USM Corporation. Elastomeric bumper securing press fit clip. 4,043,579, Cl. 293-71.00R.
Meyer, Willy: *See*—
Boehner, Beat; Dawes, Dag; and Meyer, Willy, 4,044,124, Cl. 424-200.000.
Meyers, George Leroy; and Mueller, David Charles, to American Can Company. Reclosable carton. 4,043,503, Cl. 206-613.000.
Mickelson, Micheal J., to Minnesota Mining and Manufacturing Company. Automatic microfilm handling apparatus. 4,043,652, Cl. 353-26.00A.
Mida Mfg. Inc.: *See*—
Love, Michael, 4,043,449, Cl. 206-45.140.
Midland-Ross Corporation: *See*—
Durling, Harold, 4,043,351, Cl. 137-554.000.
Migliaccio, Mariano; and Pisani, Emilio, to Consiglio Nazionale Delle Ricerche. Air-fuel ratio control system for internal-combustion engines with controlled ignition. 4,043,303, Cl. 123-119.00R.
Mikuni Kogyo Kabushiki Kaisha: *See*—
Seino, Tadashi, 4,043,711, Cl. 417-469.000.
Milano, Lawrence V., to Raymond Lee Organization, Inc., The. Artist's brush with disposable cartridge. 4,043,680, Cl. 401-40.000.
Milgo Electronic Corporation: *See*—
Borysiewicz, Richard; and Roedel, Charles W., 4,044,307, Cl. 325-42.000.
Miller, Alvin J.; and Tuckett, William F., to Phillips Petroleum Company. Removal of mercury from gas streams using hydrogen sulfide and amines. 4,044,098, Cl. 423-210.000.
Miller, George H.: *See*—
Williams, Ben; and Miller, George H., 4,043,006, Cl. 24-90.00R.
Miller, John J.; Baus, Richard E.; and Lewis, Sheldon N., to Rohm and Haas Company. Coated metal article. 4,044,190, Cl. 428-463.000.
Miller, John J.: *See*—
Hutton, Thomas W.; Miller, John J.; Wempe, Lawrence K.; and Lewis, Sheldon N., 4,043,956, Cl. 260-23.00R.
Miller, Joseph; and Cline, Clinton. Safety mine car coupling and uncoupling apparatus. 4,043,457, Cl. 213-75.00B.
Miller, Lewis J.; and Klarman, Casimir M., to Westinghouse Electric Corporation. Thrust bearing locating device and a method for locating a thrust bearing within a turbine casing. 4,043,615, Cl. 308-32.000.
Miller, William J., Jr.: *See*—
Padden, Thomas R.; Miller, William J., Jr.; and Laubham, Rockne L., 4,043,500, Cl. 228-175.000.
Millham, Ernest H.: *See*—
Foreman, Steven H.; Millham, Ernest H.; Ortloff, James E.; and Prilik, Ronald Jay, 4,044,244, Cl. 235-153.0AC.
Milliken Research Corporation: *See*—
Fusco, Anthony M., 4,044,033, Cl. 260-404.000.
Mills, Manuel Dee. Dynanometer for a pump-off control. 4,043,191, Cl. 73-151.000.
Mills Products, Inc.: *See*—
Katona, Joseph W., 4,043,091, Cl. 52-616.000.
Milstein, Donald; and Stein, Thomas R., to Mobil Oil Corporation. Conversion of Fischer-Tropsch heavy product to high quality jet fuel. 4,044,064, Cl. 260-676.00R.
Mimura, Koji: *See*—
Kametani, Yoshiya; Nakahama, Tetsuro; Kawai, Atsushi; and Mimura, Koji, 4,044,076, Cl. 260-969.000.
Miner, Antonia V.; and Nichols, Joseph, to Toni Totes of Vermont, Inc. Needlework frame. 4,043,270, Cl. 38-102.910.
Minnesota Mining and Manufacturing Company: *See*—
Berg, Eric P., 4,043,967, Cl. 260-30.4EP.
Ko, Su Sen, 4,044,121, Cl. 424-71.000.
Loudas, Basil L., 4,043,923, Cl. 252-8.750.
Mickelson, Micheal J., 4,043,652, Cl. 353-26.00A.
Sherman, Patsy O.; and Smith, Samuel, 4,043,964, Cl. 260-29.60F.
Taylor, Allen L.; and Ensign, Thomas C., 4,044,251, Cl. 250-342.000.
Minowa, Osami, to Hochiki Corporation. Ionization smoke sensor. 4,044,262, Cl. 250-381.000.
Miquel, Jean: *See*—
Juguin, Bernard; Cosyns, Jean; Le Page, Jean-Francois; and Miquel, Jean, 4,043,944, Cl. 252-441.000.
Miranol Chemical Company, Inc., The: *See*—
Christiansen, Arvid, 4,044,034, Cl. 260-404.500.
Mitchell, Terry L.: *See*—
Propst, Robert L.; Kelley, James O.; and Mitchell, Terry L., 4,043,626, Cl. 339-23.000.
Mitsubishi Chemical Industries Ltd.: *See*—
Ashida, Kaneyoshi; Ohtani, Masaaki; Ichii, Makoto; and Kobayashi, Tatsuhiko, 4,044,184, Cl. 428-113.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Onishi, Masayoshi; and Aiyama, Yoshinobu, 4,043,030, Cl. 29-622.000.
Ueda, Fumio; and Arai, Hirotsugu, 4,044,345, Cl. 340-324.00M.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Kisuna, Keiichi; Toyama, Satoru; and Kimura, Hiroshi, 4,043,022, Cl. 29-460.000.
Yamanaka, Akira, 4,043,585, Cl. 296-35.00R.
Mitsubishi Jukogyo Kabuskiki Kaisha: *See*—
Nishino, Mutsumi; Sasaki, Hideo; Uda, Kazumi; Tamura, Motohiko; Hiyama, Kunihiko; and Fujiike, Hiroshi, 4,043,769, Cl. 55-25.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Kametani, Yoshiya; Nakahama, Tetsuro; Kawai, Atsushi; and Mimura, Koji, 4,044,076, Cl. 260-969.000.
Miura, Mitsuo: *See*—
Endo, Masaaki; Miura, Mitsuo; Kukino, Yoshinori; Kikuchi, Kimio; and Aoyagi, Hayao, 4,043,909, Cl. 210-49.000.
Miyamoto, Toshio, to Marumiya Shoko Co., Ltd. Back-splitting apparatus in the production of brochures. 4,043,235, Cl. 83-207.000.
Miyatake, Takahumi: *See*—
Kashioka, Seiji; Kameyama, Masayoshi; Ejiri, Masakazu; and Miyatake, Takahumi, 4,044,311, Cl. 328-139.000.
Miyoshi, Isao; Abe, Masaru; Tezuka, Toshiro; and Yoshimoto, Toshio, to Bridgestone Tire Company Limited. Pneumatic tire for off-road vehicles. 4,043,372, Cl. 152-354.000.
Mizuguchi, Teruki: *See*—
Tsunemoto, Shiro; Mizuguchi, Teruki; and Hirayama, Eiichi, 4,043,726, Cl. 425-563.000.
Mizuno, Zenichiro: *See*—
Suzuki, Teiji; and Mizuno, Zenichiro, 4,043,519, Cl. 242-55.530.
Mlecka, Louis F.: *See*—
Giallourakis, Michael A.; and Mlecka, Louis F., 4,043,587, Cl. 296-91.000.
Mobay Chemical Corporation: *See*—
Baron, Arthur L.; and Sivaramakrishnan, Parameswar, 4,043,980, Cl. 260-47.0XA.
Baron, Arthur L.; and Rawlings, Herbert L., 4,044,073, Cl. 260-860.000.
Mobil Oil Corporation: *See*—
Anderson, Conroy D.; Schatz, Klaus W.; and Snyder, Paul W., Jr., 4,043,899, Cl. 208-161.000.
Anderson, Ronald W., 4,043,963, Cl. 260-29.40R.
Chang, Clarence D.; Silvestri, Anthony J.; and Zahner, John C., 4,044,061, Cl. 260-668.00R.
Godfrey, William L., 4,044,288, Cl. 318-485.000.

Ireland, Henry R.; and Stein, Thomas R., 4,044,063, Cl. 260-676.00R.
Milstein, Donald; and Stein, Thomas R., 4,044,064, Cl. 260-676.00R.
Spencer, Arthur T.; and Siranovich, Stanley F., 4,043,968, Cl. 260-33.40R.
Mobile Oil Corporation: *See—*
Butter, Stephen A.; and Kaeding, Warren W., 4,044,065, Cl. 260-677.00R.
Mobley, David F.; and Baum, Neil H., to Baylor College of Medicine. Catheter. 4,043,346, Cl. 128-349.00R.
MOD-SOD Sport Surfaces: *See—*
Haas, Frederick T., Jr., 4,044,179, Cl. 428-17.000.
Model, Ernst; and Pugin, Andre, to Ciba-Geigy Corporation. Methyl or methoxy substituted iminoisoindolinone pigments. 4,043,999, Cl. 260-152.000.
Modesto, Narciso G.; and Brejcha, Robert J. Vibratory compacting machine. 4,043,738, Cl. 425-456.000.
Mogannam, Paul. Recreational device. 4,043,565, Cl. 280-11.120.
Molins Limited: *See—*
Hirsh, Ivan Y., 4,043,182, Cl. 73-41.000.
Molins Macine Company, Inc.: *See—*
Grobman, William, 4,043,265, Cl. 101-350.000.
Mollard, Paul; and Mesaros, Louis, to Produits Chimiques Ugine Kuhlmann. Storage-stable sodium chlorite. 4,044,103, Cl. 423-267.000.
Momose, Yutaka, to Aisin Seiki Kabushiki Kaisha. Power shift transmission for motor vehicles. 4,043,225, Cl. 74-761.000.
Monsanto Company: *See—*
Bloomfield, Jordan J.; and Owsley, Dennis C., 4,044,057, Cl. 260-617.00F.
Dahms, Ronald H., 4,043,970, Cl. 260-29.300.
Paster, Mark D., 4,043,955, Cl. 260-23.70A.
Montesi, Edward N., to Dart Industries Inc. Spoon holder and measuring spoon set. 4,043,203, Cl. 73-427.000.
Moore, Charles E., Jr.; Crane, Sammy L.; and Lipke, Donald L., to Biometrics Instrument Corporation, A Division of Varo, Inc. Voltage supply including bilateral attenuator. 4,044,249, Cl. 250-213.0VT.
Moore, John H., to United States of America, Air Force. Integrated circuit wiring bridge apparatus. 4,044,397, Cl. 361-398.000.
Moore, Robert E.: *See—*
Duling, Irl N.; Gates, David S.; Glazier, Frederick P.; and Moore, Robert E., 4,043,927, Cl. 252-52.00R.
Moreau, Alain, to Alcan Research and Development Limited. Apparatus for loading stillages. 4,043,459, Cl. 214-6.0DK.
Morgan, Clyde R.; and Blocksom, David C., to Wheelsport Distributing Co. Helmet face guard accessory for motorcycle riders. 4,042,974, Cl. 2-9.000.
Morgan, Grant T., to Dymo Industries, Inc. Laser photocomposition system and method. 4,044,363, Cl. 354-5.000.
Mori, Akira: *See—*
Takeda, Tsuneshi; Atarashi, Yasuyuki; and Mori, Akira, 4,043,904, Cl. 210-28.000.
Mori, Akiyoshi: *See—*
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Mori, Kazuo: *See—*
Ishizumi, Kikuo; Mori, Kazuo; Okamoto, Tadashi; Akase, Takeshi; Izumi, Takahiro; Akatsu, Mitsuhiro; Kume, Yoshiharu; Inaba, Shigeho; and Yamamoto, Hisao, 4,044,003, Cl. 260-239.0BD.
Morii Chokoku Co., Ltd.: *See—*
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Morii, Hideaki: *See—*
Kajimoto, Isamu; and Morii, Hideaki, 4,043,262, Cl. 101-7.000.
Morin, Edmond A.: *See—*
Skarbo, Roald R.; Peterson, Hal D.; and Morin, Edmond A., 4,043,882, Cl. 204-106.000.
Morinaga & Co., Ltd.: *See—*
Sato, Fumio, 4,043,259, Cl. 99-353.000.
Morine, Richard L.; and Hokes, James J., to Fedco Inc. Cake icing apparatus. 4,043,294, Cl. 118-9.000.
Morishita Chemical Industry Co. Ltd.: *See—*
Ochiai, Fukuzo, 4,043,085, Cl. 52-3.000.
Moriuchi, Shigenori: *See—*
Okutsu, Eiichi; Hayashi, Katsumi; Moriuchi, Shigenori; and Sakai, Takeo, 4,043,817, Cl. 96-66.00R.
Moriwaki, Yoshinaga: *See—*
Tsukada, Tameyasu; Sumi, Yoshio; Moriwaki, Yoshinaga; Oshio, Hirosuke; Ueda, Katsunobu; and Umino, Yoiti, 4,043,618, Cl. 308-174.000.
Morizur, Gabrielle: *See—*
Le Noane, Georges E.; Mathern, Andre M.; and Morizur, Gabrielle, 4,043,854, Cl. 156-158.000.
Morris, David A.; Flournoy, Norman E.; and Langley, Thomas W., to Texaco Inc. Gathering line leak detection system tester. 4,043,180, Cl. 73-40.50A.
Morris, Harold B.: *See—*
McDaniel, John E.; and Morris, Harold B., 4,043,682, Cl. 401-199.000.
Morris, Ralph; and Turner, William Gordon, to Morris Turner Pty. Limited. Inflating probe. 4,043,356, Cl. 137-320.000.
Morris Turner Pty. Limited: *See—*
Morris, Ralph; and Turner, William Gordon, 4,043,356, Cl. 137-320.000.
Morris, William E. Non-aerosol type dispenser. 4,043,510, Cl. 239-323.000.
Morrison, Burk Guy. Tooth for a roto tiller. 4,043,399, Cl. 172-42.000.
Morrison, Charles F., Jr., to Valleylab, Inc. Electrosurgical devices having sesquipolar electrode structures incorporated therein. 4,043,342, Cl. 128-303.140.
Morrison, Wilbur J.; and Tress, Norwood E., to Bell & Howell Company. In-line inserter. 4,043,551, Cl. 271-243.000.
Morrow, Robert S.; and Penn, Lloyd D., to IRD Mechanalysis, Inc. Circuitry for generating a sine wave and/or cosine wave from a pulse signal. 4,044,310, Cl. 328-27.000.
Mortimer, James R.: *See—*
Reese, Thomas J.; Tobin, Melvin W.; and Mortimer, James R., 4,043,784, Cl. 65-107.000.
Morton-Norwich Products, Inc.: *See—*
Schwan, Thomas J., 4,044,008, Cl. 260-251.00R.
Mosbacher, Rudolf; and Ruppik, Hans, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Process for making sheet-metal planet carrier. 4,043,021, Cl. 29-437.000.
Moss, Gerald; Johnes, Graham Lloyd; and Craig, John William Thomas, to United States of America, Administrator, Environmental Protection Agency. Burner equipment and operation thereof. 4,043,741, Cl. 431-3.000.
Moss, Philip H.: *See—*
Brennan, Michael E.; Moss, Philip H.; and Yeakey, Ernest L., 4,044,053, Cl. 260-583.00P.
Moss, Robert H.; Swinehart, Carl F.; and Spicuzza, William F., to Harshaw Chemical Company, The. Hot-pressable magnesium fluoride powder. 4,044,112, Cl. 423-490.000.
Mosser Industries, Inc.: *See—*
Gottshall, Edward R., 4,043,534, Cl. 251-174.000.
Mosteller, James K.: *See—*
Keller, Alex J.; Williams, Joseph R.; and Mosteller, James K., 4,043,464, Cl. 214-17.0CA.
Motoren- und Turbinen-Union Friedrichshafen GmbH: *See—*
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Sessions, Douglas Charles, 4,043,302, Cl. 123-117.00R.
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Mould, George, executor: *See—*
Hambling, Peter G.; Owen, Leslie W., deceased; Owen, Elizabeth Bertram, executrix; and Mould, George, executor, 4,043,876, Cl. 204-9.000.
Mounteer, Carl A.; and Sizgorich, Anthony T., to Gulton Industries, Inc. Flow rate transducer. 4,043,197, Cl. 73-205.00R.
MTU-Motoren-und Turbinen-Union: *See—*
Puhr-Westerheide, Jorg, 4,043,883, Cl. 204-129.650.
Mueller, David Charles: *See—*
Meyers, George Leroy; and Mueller, David Charles, 4,043,503, Cl. 206-613.000.
Mui, Jeffrey Y. P.; and Pines, Arthur N., to Union Carbide Corporation. Sulfur containing silane coupling agents. 4,044,037, Cl. 260-448.20N.
Mullarkey, William Joseph, to Cunard Steam-Ship Company Limited, The. Reception techniques for improving intelligibility of an audio frequency signal. 4,044,205, Cl. 179-1.00P.
Mullen, Larry P., to Scientific Engineering, Inc. Vibratory compactor. 4,043,694, Cl. 404-133.000.
Muller, Hanns Peter; Wagner, Kuno; and Muller, Richard, to Bayer Aktiengesellschaft. Process for polyaddition products which contain uretdione groups and use in coatings. 4,044,171, Cl. 427-27.000.
Muller, Karl-Heinz: *See—*
Krisch, Burkhard; Muller, Karl-Heinz; Rauch, Moriz von; and Veneklasen, Lee H., 4,044,256, Cl. 250-311.000.
Muller, Martin; Hinsche, Friedrich; Winter, Gerhard; and Brandle, Karl, to Bayer Aktiengesellschaft. Production of foamed gypsum moldings. 4,043,825, Cl. 106-87.000.
Muller, Richard: *See—*
Muller, Hanns Peter; Wagner, Kuno; and Muller, Richard, 4,044,171, Cl. 427-27.000.
Mullins, Phillip Leroy: *See—*
Weiss, William Robert; Cooksey, James Judson; and Mullins, Phillip Leroy, 4,043,008, Cl. 28-271.000.
Munsch, John Michael, to Baxter Laboratories, Inc. Clamp-on injection site. 4,043,333, Cl. 128-214.00R.
Murakami, Tadashi: *See—*
Tomita, Kazuo; Murakami, Tadashi; Yamazaki, Yoshio; and Honma, Toyokuni, 4,044,018, Cl. 260-307.00A.
Muraki, Ryoji; Endo, Masao; Aoki, Nobuaki; and Takeshita, Masahiro, to Kurashiki Boseki Kabushiki Kaisha. Method for treating exhaust gases. 4,044,102, Cl. 423-239.000.
Murley, Roger W.: *See—*
Lahr, Fred H.; and Murley, Roger W., 4,043,101, Cl. 56-17.100.
Musgrave, Daniel Dennis. Pistol charging socket. 4,043,065, Cl. 42-1.00R.
Myers, Dick T., to PPG Industries, Inc. Glass sheet conveyor rolls and process for conveying thereon. 4,043,786, Cl. 65-114.000.
N.P.I. Corporation: *See—*
Curtis, Richard E.; Dench, Robert H.; and Dervin, Victor J., 4,044,078, Cl. 261-30.000.
Nacci, Anthony T.: *See—*
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Nagamori, Lomitado: *See—*
Yoshikawa, Toshio; Sakamoto, Nagayoshi; Kurita, Masayuki; Oh-e, Shunji; and Nagamori, Lomitado, 4,043,976, Cl. 260-45.80N.

Nagano, Syuzi: *See—*
Ohnuma, Kiyoshi; and Nagano, Syuzi, 4,043,223, Cl. 74-688.000.

Najer, Henry; Dupont, Regis; and Giudicelli, Don Pierre Rene Lucien, to Synthelabo. Substituted piperazine derivative, its preparation and anorexia compositions containing it. 4,044,132, Cl. 424-250.000.

Nakada, Tetsuo, to Janome Sewing Machine Co. Printing machine with vertically shiftable credit card supporting plate. 4,043,263, Cl. 101-45.000.

Nakagome, Takenari: *See—*
Hamma, Noritaka; Fukumura, Masataka; Maeshima, Kaoru; and Nakagome, Takenari, 4,043,991, Cl. 260-112.50R.

Nakahama, Tetsuro: *See—*
Kametani, Yoshiya; Nakahama, Tetsuro; Kawai, Atsushi; and Mimura, Koji, 4,044,076, Cl. 260-969.000.

Nakajima, Fumito: *See—*
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Nakamizo, Nobuhiro: *See—*
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Nakamura, Kenji; Jinnai, Toshio; Totani, Kazuo; and Furuta, Shigetaro, to Dai Nippon Toryo Co., Ltd. Liquid crystal electro optical element. 4,043,634, Cl. 350-160.0LC.

Nakamura, Koichi: *See—*
Shimamura, Isao; and Nakamura, Koichi, 4,043,814, Cl. 96-10.000.

Nakamura, Norihiko: *See—*
Kato, Takashi; Hoshi, Koichi; and Nakamura, Norihiko, 4,043,309, Cl. 123-191.0SP.

Nakamura, Toshio, to Sanyei Corporation. Shower head. 4,043,511, Cl. 239-394.000.

Nakayama, Norihiko: *See—*
Andoh, Shizuo; and Nakayama, Norihiko, 4,044,349, Cl. 340-324.00M.

Narayanan, Venkatachala L.: *See—*
Hauck, Frederic Peter; Reid, Joyce; Narayanan, Venkatachala L.; Cimarusti, Christopher M.; Haugwitz, Rudiger D.; and Sundeen, Joseph E., 4,044,040, Cl. 260-456.00P.

Narco Scientific Industries, Inc.: *See—*
Smith, John F., 4,044,309, Cl. 325-478.000.

Naremco, Inc.: *See—*
Jackson, Dennis E., 4,044,152, Cl. 424-329.000.

Narihiro, Michiaki; and Nishimura, Akira, to New Nippon Electric Company, Ltd. Channel selecting shaft mounting arrangement for UHF tuners. 4,043,206, Cl. 74-10.540.

Narozny, Ronald S., to Thomas & Betts Corporation. Electrical contact. 4,043,628, Cl. 339-99.00R.

Nashiwa, Hajime; Mori, Akiyoshi; and Tokuda, Makoto, to Sumitomo Metal Industries Limited. Process for producing steel having improved low temperature impact characteristics. 4,043,798, Cl. 75-53.000.

National Controls, Inc.: *See—*
Rock, Frank C., 4,043,412, Cl. 177-25.000.

National Research Development Corporation: *See—*
Cunningham, Sinclair Upton, 4,043,255, Cl. 92-158.000.
Hughes, Austin; and Lawrenson, Peter John, 4,044,291, Cl. 318-696.000.
Swanson, Sydney Alan Vasey; and Roper, Brian Arnold, 4,042,980, Cl. 3-1.910.
Swinbanks, Malcolm Alexander, 4,044,203, Cl. 179-1.00P.

National Semiconductor Corporation: *See—*
Spadea, Gregorio, 4,043,025, Cl. 29-571.000.
Sporck, Christian R., 4,043,969, Cl. 260-37.0EP.

National Starch and Chemical Corporation: *See—*
Ganslaw, Stuart H.; and Katz, Howard G., 4,043,952, Cl. 260-17.4ST.

Natsugari, Hideaki: *See—*
Kuwada, Yutaka; Meguro, Kanji; Natsugari, Hideaki; Sato, Yoshiaki; and Tawada, Hiroyuki, 4,044,129, Cl. 424-248.560.

Nayak, Ashok B., to Bell & Howell Company. Photographic film assembly and magazine therefor. 4,044,369, Cl. 354-275.000.

NCR Corporation: *See—*
Shulski, Anton P., 4,044,280, Cl. 315-169.0TV.

Neff, Edward C., to Westinghouse Electric Corporation. Method and tool for removing tubes from multi-tube finned heat exchange coil. 4,043,018, Cl. 29-427.000.

Neidermyer, Robert W.: *See—*
Graham, Bruce A.; Puttock, Michael A.; Felauer, Ethel E.; and Neidermyer, Robert W., 4,043,792, Cl. 71-78.000.

Nelson, Albert W., to Koehring Company. Soil stabilizer machine with detachable hydraulic motor structure driving rotatably mounted cutting elements. 4,043,402, Cl. 172-112.000.

Nelson, Albin J., to Pfizer Inc. N-(acyl)-p-amino-N'-(monosubstituted)-benzamide anti-ulcer agents. 4,044,147, Cl. 424-309.000.

Nemitz, Gunter: *See—*
Reif, Hans-Heinrich; Wehner, Klaus; Welker, Jurgen; Schmidt, Karl-Heinz; Schnick, Waltraud; Widmann, Lutz; Schicker, Otto; Seidel, Gunter; Kalb, Karsten; Dollase, Wolfhard; Furtig, Helmut; Hose, Werner; Roscher, Wolfgang; Hadicke, Udo; Knoll, Herbert; Seidel, Rudiger; Nemitz, Gunter; Sturmer, Edith; and Kaiser, Manfred, 4,043,938, Cl. 252-412.000.

Neresian, Leonard Sarkis: *See—*
Brown, Tony Ray; and Neresian, Leonard Sarkis, 4,043,334, Cl. 128-215.000.

Nestor Associates: *See—*
Cooper, Leon N.; and Elbaum, Charles, 4,044,243, Cl. 235-152.000.

Nettles, Robbie B., to Raymond Lee Organization, Inc., The, a part interest. Sanding device for increased vehicle traction. 4,043,577, Cl. 291-25.000.

Neuzil, Richard W.: *See—*
Korous, Donald J.; and Neuzil, Richard W., 4,044,062, Cl. 260-674.0SA.

New England Union Co.: *See—*
Draxler, Helmut J., 4,043,532, Cl. 251-11.000.

New-Invent S.A.: *See—*
Freese, Lennart Werner, 4,043,613, Cl. 308-9.000.

New Nippon Electric Company, Ltd.: *See—*
Narihiro, Michiaki; and Nishimura, Akira, 4,043,206, Cl. 74-10.540.

New Products Development, Inc.: *See—*
Elliott, Albert Winslow, Jr.; and Elliott, Albert W., III, 4,042,975, Cl. 2-19.000.

New York Institute of Technology: *See—*
Nigam, Anant K., 4,043,181, Cl. 73-67.80R.

Newell, Darrell E.; Jennings, John F.; Fritsch, Steven Lyle; and Hinnah, Howard D., to CTS Corporation. Crystal controlled square wave oscillator. 4,044,317, Cl. 331-116.00R.

Newland, Gordon C.: *See—*
Pacifici, James G.; Wang, Richard H. S.; and Newland, Gordon C., 4,043,887, Cl. 204-159.230.

Nibby, Chester M., Jr.: *See—*
Johnson, Robert B.; and Nibby, Chester M., Jr., 4,044,330, Cl. 340-166.00R.

Nichols, Joseph: *See—*
Miner, Antonia V.; and Nichols, Joseph, 4,043,270, Cl. 38-102.910.

Nichols, William V., Jr.: *See—*
Gonzalez, Juan M.; and Nichols, William V., Jr., 4,043,892, Cl. 204-247.000.

Nickol, Stephen L., to Suntech, Inc. Single step preparation of block copolymer of polyamides. 4,044,071, Cl. 260-857.0TW.

Nicolaides, Ernest D.: *See—*
Tinney, Francis John; Nicolaides, Ernest D.; and Campbell, Alfred, 4,043,993, Cl. 260-112.5LH.
Wittle, Eugene Leroy; Nicolaides, Ernest D.; and Hutt, Marland Paul, 4,043,994, Cl. 260-112.5LH.

Nigam, Anant K., to New York Institute of Technology. Ultrasonic pulse-echo apparatus. 4,043,181, Cl. 73-67.80R.

Nilsen, Henning Reier: *See—*
Hansen, Rolf Steen; Lie, Ole Hannibal; Nilsen, Henning Reier; and Sandal, Thor, 4,043,789, Cl. 71-34.000.

Nippon Electric Company, Ltd.: *See—*
Ando, Fumio, 4,043,240, Cl. 84-1.010.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Kasai, Yuuji; Ogura, Hironuri; and Toyoda, Atsushi, 4,043,376, Cl. 164-7.000.
Shimauchi, Minoru; and Onoda, Takashi, 4,044,239, Cl. 235-151.300.

Nippon Kogaku K.K.: *See—*
Fukino, Kunihiro, 4,043,691, Cl. 403-322.000.
Hamaguchi, Ichiro; and Toyoda, Kenji, 4,044,304, Cl. 324-133.000.
Toyoda, Kenji, 4,043,677, Cl. 356-227.000.

Nippon Kokan Kabushiki Kaisha: *See—*
Saito, Katashi; Matsumoto, Toshio; Hasebe, Nobuhisa; and Kobatake, Tatsuo, 4,043,382, Cl. 164-76.000.
Sakamoto, Eiichi; Kubo, Masanobu; Yasui, Takashi; Suzuki, Katsuya; and Tachibana, Katsuhiko, 4,043,801, Cl. 75-60.000.

Nippon Paint: *See—*
Nishimura, Masakatsu; Saito, Shin; Tanabe, Kunsei; Umeda, Yasusi; Arimatsu, Seiji; and Takimoto, Yasuyuki, 4,044,385, Cl. 358-300.000.

Nippon Soken, Inc.: *See—*
Hattori, Yoshiyuki; Suzuki, Mikio; and Taguchi, Masahiro, 4,043,572, Cl. 280-738.000.

Nippon Steel Corporation: *See—*
Hayami, Satohiro; Imamura, Jun; Hayakawa, Hiroshi; and Yabuta, Tadatzugu, 4,043,805, Cl. 75-123.00L.

Nippon Tungsten Co., Ltd.: *See—*
Otsuki, Yukio; Matsumoto, Hiroyuki; Ito, Hiroshi; and Takezaki, Shusuke, 4,044,217, Cl. 219-76.000.

Nippondenso Co., Ltd.: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Taro; and Fujisawa, Hideya, 4,043,307, Cl. 123-139.0AW.

Nishimura, Akira: *See—*
Narihiro, Michiaki; and Nishimura, Akira, 4,043,206, Cl. 74-10.540.

Nishimura, Masakatsu; Saito, Shin; Tanabe, Kunsei; Umeda, Yasusi; Arimatsu, Seiji; and Takimoto, Yasuyuki, to Nippon Paint. Printing plate production apparatus. 4,044,385, Cl. 358-300.000.

Nishino, Mutsumi; Sasaki, Hideo; Uda, Kazumi; Tamura, Motohiko; Hiyama, Kunihiko; and Fujiike, Hiroshi, to Mitsubishi Jukogyo Kabuskiki Kaisha; and Shell Sekiyu Kabushiki Kaisha. Process for recovering a solvent vapor. 4,043,769, Cl. 55-25.000.

Nitto Chemical Industry Co., Ltd.: *See—*
Kametani, Yoshiya; Nakahama, Tetsuro; Kawai, Atsushi; and Mimura, Koji, 4,044,076, Cl. 260-969.000.

Noakes, Jack E.; Sato, Hiroshi; and Terner, Leslie L., to Ford Motor Company. Method of forming a silicon carbide article - III. 4,044,110, Cl. 423-346.000.

Nobue, Takaaki; Itou, Masao; Yamamoto, Katsuhiko; and Hori,

Makoto, to Matsushita Electric Industrial Co., Ltd. Ultrasonic generator with combined oscillator and current regulator. 4,044,297, Cl. 323-4.000.

Noe, Oskar; and Skrober, Wolfgang, to BWG Bergwerk- und Walzwerk-Maschinenbau G.m.b.H. Roller assembly for sheet-bending head and method of making roller bearings therefor. 4,043,162, Cl. 72-163.000.

Nogawa, Masat: *See*—
Okamoto, Tatsuo; Nogawa, Masat; and Okabe, Nobuyoshi, 4,043,037, Cl. 30-276.000.

Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Taro; and Fujisawa, Hideya, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel injection system for an internal combustion engine. 4,043,307, Cl. 123-139.0AW.

Nomiya, Kosei; Kohisa, Toshihiko; and Matsumura, Isao, to Hitachi, Ltd. IGFET with gate protection diode and antiparasitic isolation means. 4,044,373, Cl. 357-41.000.

Norddeutsche Affinerie: *See*—
Perkow, Werner; Hopp, Hans; and Ingwersen, Walter, 4,044,045, Cl. 260-470.000.

Nordstrom, Immo R. Container ship. 4,043,285, Cl. 114-72.000.

Noren, Gerry Karl, to Calgon Corporation. 2-Oxo-3-alkenyl dimethylamine. 4,044,054, Cl. 260-584.00A.

Norman, Marvin Neil, to RCA Corporation. Brightness control apparatus. 4,044,375, Cl. 358-40.000.

Norman, Oscar L.; and Seitzer, Walter H., to Suntech, Inc. Stabilization of dried coal. 4,043,763, Cl. 44-1.00R.

Norsk Hydro a.s: *See*—
Hansen, Rolf Steen; Lie, Ole Hannibal; Nilsen, Henning Reier; and Sandal, Thor, 4,043,789, Cl. 71-34.000.

North American Philips Corporation: *See*—
Cook, John Walter, 4,042,981, Cl. 4-10.000.

North American Products Corporation: *See*—
Rowlson, Peter C.; and Kuhl, Thomas J., 4,043,012, Cl. 29-105.00R.

Norton Company: *See*—
Washburn, Malcolm E.; and Hartline, Stephen D., 4,043,823, Cl. 106-40.00R.

Notheisz, Ferenc: *See*—
Karpati, Egon; Szporny, Laszlo; Bartok, Mihaly; Czombos, Jozsef; Felfoldi, Karoly; Laszlavik, Marta; and Notheisz, Ferenc, 4,044,146, Cl. 424-283.000.

Novotny, Milos V; and Grohmann, Karel, to Indiana University Foundation. Chromatographic separation columns with selectively modified active surfaces and methods for their preparations. 4,043,905, Cl. 210-31.00C.

Numabe, Hitomi, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece. 4,043,109, Cl. 58-23.00R.

O.N.E.R.A. - Office National d'Etudes et de Recherches Aerospatiales: *See*—
Bibring, Herve; Trottier, Jean-Pierre; Khan, Tasadduq; Rabinovitch, Maurice; and Stohr, Jean-Francois, 4,043,841, Cl. 148-32.500.

Oberbeck, George A., to Charles Stark Draper Laboratory, Inc., The. Apparatus for providing a displacement representative of the magnitude of a signal. 4,044,305, Cl. 324-154.00R.

Obermaier, Robert: *See*—
Kratzmann, Helmut; Heinik, Josef; Obermaier, Robert; Zentner, Erich; and Redinger, Robert, 4,043,731, Cl. 425-366.000.

Oberman, Joel Roy: *See*—
Stewart, Roger Green; and Oberman, Joel Roy, 4,044,341, Cl. 340-173.00R.

O'Brien, Edward F.: *See*—
Putnam, Roger L., Jr.; and O'Brien, Edward F., 4,043,098, Cl. 53-180.00M.

O'Brien, Michael, to University of California, The Regents of the. Fruit sub-sampler and grading table. 4,043,443, Cl. 198-525.000.

O'Brien, William L., to Emery Industries, Inc. Copolyesters derived from ethoxylated 3,5-dibromo-4-hydroxybenzoic acid. 4,043,981, Cl. 260-47.00C.

Occidental Oil Shale, Inc.: *See*—
French, Gordon B., 4,043,595, Cl. 299-2.000.
French, Gordon B., 4,043,597, Cl. 299-2.000.
French, Gordon B.; and Garrett, Donald E., 4,043,598, Cl. 299-2.000.
Ridley, Richard D., 4,043,596, Cl. 299-2.000.

Oce-van der Grinten N.V.: *See*—
Bomers, Johannes P.; and Vosbeek, Gerardus J., 4,043,816, Cl. 96-49.000.

Ochiai, Fukuzo, to Morishita Chemical Industry Co. Ltd. Lumber cover. 4,043,085, Cl. 52-3.000.

Ochii, Kiyofumi: *See*—
Suzuki, Yasoji; and Ochii, Kiyofumi, 4,044,342, Cl. 340-173.0DR.

Ochs, David J.; Behrens, James D.; and Stevens, John H. Cervical collars. 4,043,325, Cl. 128-75.000.

O'Connor, Matthew J.: *See*—
Bennett, Robert P.; and O'Connor, Matthew J., 4,043,768, Cl. 55-5.000.

O'Connor, Michael Niall Desmond: *See*—
Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., 4,044,009, Cl. 260-251.00R.

Oden, Laurance L.: *See*—
Sanker, Philip E.; Oden, Laurance L.; and Russell, James H., 4,043,946, Cl. 252-466.00J.

Oelke, Waldemar W.: *See*—
Bamford, Robert P., deceased; Herrington, Richard A.; and Oelke, Waldemar W., 4,043,782, Cl. 65-104.000.

Ogiwara, Masuji, to Rank Xerox Ltd. Pressure heat fixing device. 4,043,747, Cl. 432-60.000.

Ogura, Hironuri: *See*—
Kasai, Yuuji; Ogura, Hironuri; and Toyoda, Atsushi, 4,043,376, Cl. 164-7.000.

Ogura, Motoshige: *See*—
Enomoto, Takamitsu; Ogura, Motoshige; and Ono, Tetsuhiro, 4,044,105, Cl. 423-308.000.

Oh-e, Shunji: *See*—
Yoshikawa, Toshio; Sakamoto, Nagayoshi; Kurita, Masayuki; Oh-e, Shunji; and Nagamori, Lomitado, 4,043,976, Cl. 260-45.80N.

Ohara, Ichiro: *See*—
Tsuzurahara, Mamoru; and Ohara, Ichiro, 4,044,279, Cl. 315-39.510.

Ohm, Werner, to Stephan-Werke GmbH & Co. Transmission system. 4,044,274, Cl. 310-83.000.

Ohmi, Atushi, to Aisin Seiki Kabushiki Kaisha. Servomotor. 4,043,251, Cl. 91-376.00R.

Ohnuma, Kiyoshi; and Nagano, Syuzi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Overdrive mechanism for automatic power transmission. 4,043,223, Cl. 74-688.000.

Ohtani, Masaaki: *See*—
Ashida, Kaneyoshi; Ohtani, Masaaki; Ichii, Makoto; and Kobayashi, Tatsuhiko, 4,044,184, Cl. 428-113.000.

Okabe, Nobuyoshi: *See*—
Okamoto, Tatsuo; Nogawa, Masat; and Okabe, Nobuyoshi, 4,043,037, Cl. 30-276.000.

Okamoto, Tadashi: *See*—
Ishizumi, Kikuo; Mochi, Kazuo; Okamoto, Tadashi; Akase, Takeshi; Izumi, Takahiro; Akatsu, Mitsuhiro; Kume, Yoshiharu; Inaba, Shigeho; and Yamamoto, Hisao, 4,044,003, Cl. 260-239.0BD.

Okamoto, Tatsuo; Nogawa, Masat; and Okabe, Nobuyoshi, to Kioritz Corporation. Cord-type mowing tool. 4,043,037, Cl. 30-276.000.

Oki Electric Industry Co., Ltd.: *See*—
Yagishita, Tohmi, 4,044,382, Cl. 358-260.000.

Okutsu, Eiichi; Hayashi, Katsumi; Moriuchi, Shigenori; and Sakai, Takeo, to Fuji Photo Film Co., Ltd. Method of forming photographic images for lithographic use. 4,043,817, Cl. 96-66.00R.

Oldershaw, Reginald W.; and Busby, Edwin S., Jr., to Ampex Corporation. Method and apparatus for measuring the speed at which a tape was recorded. 4,044,389, Cl. 360-73.000.

Olds, George Milton. Coupling means for test tubes and the like. 4,043,762, Cl. 23-292.000.

Olinkraft, Inc.: *See*—
Graser, Earl J., 4,043,095, Cl. 53-26.000.

Olsman, Herman: *See*—
Steenhoek, Arie; and Olsman, Herman, 4,044,168, Cl. 426-613.000.

Olson, Richard O.; and Pohto, Gerald R., to Diamond Shamrock Corporation. Dimensionally stable anode and method and apparatus for forming the same. 4,044,218, Cl. 219-91.000.

Olsson, Willy John; and Swede, Harald Georg, to AB Ziristor. Method and arrangement for registered splicing of a web of material while it is in motion. 4,043,520, Cl. 242-58.100.

Olympus Optical Co., Ltd.: *See*—
Komiya, Osamu, 4,043,323, Cl. 128-4.000.
Sato, Masaaki, 4,044,233, Cl. 235-92.0PE.

Onishi, Masayoshi; and Aiyama, Yoshinobu, to Mitsubishi Denki Kabushiki Kaisha. Process for preparing distribution rotor. 4,043,030, Cl. 29-622.000.

Ono, Kunio: *See*—
Hanazono, Masanobu; Asai, Osamu; and Ono, Kunio, 4,044,394, Cl. 360-123.000.

Ono, Tetsuhiro: *See*—
Enomoto, Takamitsu; Ogura, Motoshige; and Ono, Tetsuhiro, 4,044,105, Cl. 423-308.000.

Onoda, Takashi: *See*—
Shimauchi, Minoru; and Onoda, Takashi, 4,044,239, Cl. 235-151.300.

Oosawa, Koichi: *See*—
Ichimiya, Touru; and Oosawa, Koichi, 4,043,310, Cl. 123-179.00G.

Opel, Alan E.: *See*—
Egan, Dale W.; Gilbert, Lyman F.; Lord, Harry C.; Opel, Alan E.; and Holstrom, Geoffrey B., 4,043,742, Cl. 431-12.000.

OPTI Patent-, Forschungs- und Fabrikations-AG: *See*—
Heimberger, Helmut, 4,043,007, Cl. 24-205.10C.

Orcutt, Frederic K., to Ampex Corporation. Bearing structure. 4,043,612, Cl. 308-9.000.

Orel, Jeannette V. Smoke sorbing device. 4,043,776, Cl. 55-385.00G.

Orona, Fidel, to Reed Irrigation Systems. Self cleaning filter assembly with fluttering inner filter member. 4,043,918, Cl. 210-356.000.

Orpana, Robert J., to Panatrac Manufacturing Corporation Limited. Tracked vehicle suspension systems. 4,043,417, Cl. 180-9.540.

Ortho Pharmaceutical Corporation: *See*—
Homm, Roger; and Katz, Gilbert, 4,043,338, Cl. 128-260.000.
Wagstaff, Paul Arlen, 4,043,757, Cl. 23-230.00B.

Ortlieb, Robert M., to DeVlieg Machine Company. Self-retracting tool. 4,043,229, Cl. 82-24.00A.

Ortloff, James E.: *See*—
Foreman, Steven H.; Millham, Ernest H.; Ortloff, James E.; and Prilik, Ronald Jay, 4,044,244, Cl. 235-153.0AC.

O'Shea, Robert P.: *See*—
Watmough, Thomas; and O'Shea, Robert P., 4,043,808, Cl. 75-126.00E.

Oshio, Hirosuke: *See—*
Tsukada, Tameyasu; Sumi, Yoshio; Moriwaki, Yoshinaga; Oshio, Hirosuke; Ueda, Katsunobu; and Umino, Yoiti, 4,043,618, Cl. 308-174.000.

O'Sullivan, Denis J.; Bolger, Bernard J.; and Casey, T. Eisert, to Loctite (Ireland) Limited. Peroxide initiated polymerizable acrylate-isocyanate monomer compositions. 4,043,982, Cl. 260-47.0UA.

Oswald, Bernard J.: *See—*
Bergmann, Henry F.; and Oswald, Bernard J., 4,043,603, Cl. 301-63.0PW.

Otis Elevator Company: *See—*
White, Lawrence Eugene; and Woolsey, Arthur Brantlyn, 4,043,428, Cl. 187-17.000.

Otis Engineering Corporation: *See—*
Gazda, Imre I., 4,043,392, Cl. 166-217.000.

Otsuki, Yukio; Matsumoto, Hiroyuki; Ito, Hiroshi; and Takezaki, Shusuke, to Kawasaki Jukogyo Kabushiki Kaisha; and Nippon Tungsten Co., Ltd. Sliding surface working method using wire-explosion coating. 4,044,217, Cl. 219-76.000.

Ottle, Walter: *See—*
Gaysert, Gerhard; and Ottle, Walter, 4,043,761, Cl. 23-288.0FC.

Otto, Dennis L., to Timken Company, The. Rib-mounted bearing seal. 4,043,620, Cl. 308-187.200.

Oue, Michio; Asai, Osamu; Iwasaki, Kishiro; and Kawakami, Hideaki, to Hitachi, Ltd. Method of forming alignment film for liquid crystal display cell. 4,043,647, Cl. 350-320.000.

Owen, Elizabeth Bertram, executrix: *See—*
Hambling, Peter G.; Owen, Leslie W., deceased; Owen, Elizabeth Bertram, executrix; and Mould, George, executor, 4,043,876, Cl. 204-9.000.

Owen, Leslie W., deceased: *See—*
Hambling, Peter G.; Owen, Leslie W., deceased; Owen, Elizabeth Bertram, executrix; and Mould, George, executor, 4,043,876, Cl. 204-9.000.

Owens-Illinois, Inc.: *See—*
Dybala, Ambrose B.; Krall, Thomas J.; and Uhlig, Albert R., 4,043,734, Cl. 425-532.000.
Pei, Yu K., 4,043,318, Cl. 126-271.000.

Owsley, Dennis C.: *See—*
Bloomfield, Jordan J.; and Owsley, Dennis C., 4,044,057, Cl. 260-617.00F.

Owsley, Herbert B.: *See—*
Bunn, Stuart E.; and Owsley, Herbert B., 4,043,710, Cl. 417-440.000.

Ozalid Group Holdings, Limited: *See—*
Landau, Raphael, 4,043,820, Cl. 106-21.000.

Ozawa, Tetsuo: *See—*
Goetz, Alexander F. H.; Graham, Richard A.; and Ozawa, Tetsuo, 4,043,668, Cl. 356-73.000.

P.D. Pollution Control Limited: *See—*
Wray, Stanley William; and Warwick, Michael George, 4,043,280, Cl. 110-7.00R.

P. Fanghanel & Company Limited: *See—*
Fanghanel, Peter Frederick Walter, 4,043,282, Cl. 112-3.00R.

Pace, Aylmer Raymond. Device for measuring the amount of product in bottles, jars and containers. 4,043,043, Cl. 33-137.00L.

Pachmayr, Frank A.; and Farrar, Jack R., to Pachmayr Gun Works, Inc. Pistol grip. 4,043,066, Cl. 42-71.00P.

Pachmayr Gun Works, Inc.: *See—*
Pachmayr, Frank A.; and Farrar, Jack R., 4,043,066, Cl. 42-71.00P.

Pacholok, Jaroslaw: *See—*
Van Dam, John F.; and Pacholok, Jaroslaw, 4,043,859, Cl. 156-566.000.

Pacifici, James G.; Wang, Richard H. S.; and Newland, Gordon C., to Eastman Kodak Company. Benzophenone initiators for the photopolymerization of unsaturated compounds. 4,043,887, Cl. 204-159.230.

Package Machinery Company: *See—*
Putnam, Roger L., Jr.; and O'Brien, Edward F., 4,043,098, Cl. 53-180.00M.

Padden, Thomas R.; Miller, William J., Jr.; and Laubham, Rockne L., to Westinghouse Electric Corporation. Tube to tube brazing. 4,043,500, Cl. 228-175.000.

Padgett, James M. Security box. 4,043,279, Cl. 109-50.000.

Pakur, Henryk; and Tiemann, Reinhard, to Continental Gummi-Werke Aktiengesellschaft. Bead core for pneumatic tires. 4,043,371, Cl. 152-362.00R.

Palazzolo, Salvatore E.: *See—*
McCaskey, Harold O., Jr.; and Palazzolo, Salvatore E., 4,044,185, Cl. 428-153.000.

Pallari, Kyosti. Clearing machine for brushwood. 4,043,366, Cl. 144-34.00E.

Palleduhn, Dieter: *See—*
Krueger, Friedrich; and Palleduhn, Dieter, 4,043,930, Cl. 252-89.00R.

Palmer, Harold A.; and Sample, Thomas E., Jr., to Texaco Inc. Secondary oil recovery process using oxyalkylated additives. 4,043,922, Cl. 252-8.55D.

Panatrac Manufacturing Corporation Limited: *See—*
Orpana, Robert J., 4,043,417, Cl. 180-9.540.

Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., to American Cyanamid Company. Pyrimidine alcohols and derivatives thereof. 4,044,009, Cl. 260-251.00R.

Paolino, Angelo J., to American Eyelet Co. Inc. Wire connector crimping device. 4,043,174, Cl. 72-412.000.

Paracchi, Antonio, to Textilform S.A. Apparatus for shaping floor coverings for the interiors of vehicles. 4,043,729, Cl. 425-348.00R.

Pardonner, George Nathan, Jr.: *See—*
Garofalo, Frank John, Jr.; and Pardonner, George Nathan, Jr., 4,044,331, Cl. 364-900.000.

Park, Ernest D.; and Dianetti, Joseph C., to American Optical Corporation. Optical relay for a microscope and a back aperture viewer therefor. 4,043,633, Cl. 350-54.000.

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Tinney, Francis John; Nicolaides, Ernest D.; and Campbell, Alfred, 4,043,993, Cl. 260-112.5LH.
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Sanchez, Jose, 4,043,940, Cl. 252-426.000.

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Kuhla, Donald E., 4,044,015, Cl. 260-294.80C.
Nelson, Albin J., 4,044,147, Cl. 424-309.000.
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Mathis, Ronald D., 4,043,972, Cl. 260-45.9NC.
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Bost, Howard W., 4,043,975, Cl. 260-45.75W.
Hawkins, Richard T., 4,044,056, Cl. 260-609.00E.
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Scoggin, Jack S., 4,043,773, Cl. 55-228.000.
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Pickles, Joseph, to Ferro Manufacturing Corporation. Seat adjusting mechanism. 4,043,529, Cl. 248-419.000.
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Pizzuti, Donato F.; and Skurski, James K., to Polaroid Corporation. Handle construction for self-developing cameras. 4,044,365, Cl. 354-85.000.
Pizzuti, William J., to Skytrends, Inc. Sliding roof assembly. 4,043,590, Cl. 296-137.00H.
Plastofilm Industries, Inc.: *See*—
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Plepys, Raymond A.: *See*—
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Pohl, Siegfried: *See*—
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Polysius AG: *See*—
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Poncha, Rustom P.: *See*—
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Porter, James L., to Control Data Corporation. TV monitor. 4,044,376, Cl. 358-84.000.
Portnoy, Norman A., to International Telephone and Telegraph Corporation. Process for producing regenerated cellulosic product. 4,044,090, Cl. 264-187.000.
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Chang, Wen-Hsuan; Hartman, Marvis E.; and Scriven, Roger L., 4,043,953, Cl. 260-18.00S.
Frank, Robert G., 4,043,783, Cl. 65-106.000.
Myers, Dick T., 4,043,786, Cl. 65-114.000.
Reese, Thomas J.; Tobin, Melvin W.; and Mortimer, James R., 4,043,784, Cl. 65-107.000.
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Preload Company, Inc.: *See*—
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Price, Norris F. Mortar applying machine. 4,043,487, Cl. 222-166.000.
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Propper Manufacturing Co., Inc.: *See—*
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Propst, Robert L.; Kelley, James O.; and Mitchell, Terry L., to Herman Miller, Inc. Power supply for movable office unit. 4,043,626, Cl. 339-23.000.
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Snyder, Richard C., 4,043,274, Cl. 105-409.000.
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Putnam, Roger L., Jr.; and O'Brien, Edward F., to Package Machinery Company. Vertical form, fill and seal packaging machine with improved back-up bar for longitudinal sealing. 4,043,098, Cl. 53-180.00M.
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Raczkowski, Mark B. Automatic bed making device. 4,042,985, Cl. 5-317.00R.
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Rajakovics, Gundolf E.; Gabernig, Heinz; and Klein, Guenter Peter, to Vereinigte Delstahlwerke AG. (VEW). Two-step flash technique for vaporizing radioactive liquids. 4,043,875, Cl. 203-82.000.
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Brookman, Anthony Haldane Ray, 4,043,171, Cl. 72-393.000.
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Ratledge, Edward L.; and Ware, Richard E., to Sun Oil Company of Pennsylvania. Stabilized wax emulsions. 4,043,829, Cl. 106-271.000.
Ratliff, Roger D., to PepsiCo Inc. Transport vehicle. 4,043,569, Cl. 280-423.00R.
Ratzel, Rudiger; and Steinmann, Helmut, to Robert Bosch GmbH. Circuit for energizing the electromotor driving a blower. 4,044,287, Cl. 318-432.000.
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Raycon Corporation: *See—*
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Ried, Louis, Jr.; and Wade, Arthur L., to Walter Kidde & Company, Inc. Ionization dual-zone static detector having single radioactive source. 4,044,263, Cl. 250-381.000.
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Lahr, Fred H.; and Murley, Roger W., 4,043,101, Cl. 56-17.100.
Lesser, Mark B., 4,044,270, Cl. 307-205.000.
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Rowlson, Peter C.; and Kuhl, Thomas J., to North American Products Corporation. Axially and radially adjustable cutter insert for rotary cutting tool. 4,043,012, Cl. 29-105.00R.
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Savoie, Forest J. Escape hatch for fish net. 4,043,068, Cl. 43-9.000.
Savoy, Jerry, to Savoy Manufacturing Corporation. Cover with spring opened lid. 4,043,480, Cl. 220-334.000.
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Sayers, Bernard. Apparatus for measuring the swing weight of sporting implements. 4,043,184, Cl. 73-65.000.
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Schaefer, William L., to PPG Industries, Inc. Apparatus for chopping coated glass fibers. 4,043,779, Cl. 65-2.000.
Schaenen, Susan M. Portable and collapsible bathroom-type scale. 4,043,413, Cl. 177-126.000.
Schafer, Heinz: *See—*
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Scharbach, Heinz; Engelhardt, Achim; and Bunz, Peter, to Pfaudler-Werke A.G. Surgical implant and method for its production. 4,044,170, Cl. 427-2.000.
Scharfman, Howard, to Raytheon Company. Vented solar collector. 4,043,317, Cl. 126-270.000.
Schatti, Josef. Slider for an angle adjuster for reclining furniture. 4,043,219, Cl. 74-536.000.
Schatz, Klaus W.: *See—*
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Schaub, Robert Eugene: *See—*
Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, 4,044,043, Cl. 260-468.00D.
Scheffel, Walter. Apparatus to deliver weft to fluid weft inserting means. 4,043,361, Cl. 139-452.000.
Scheldorf, Owen H., to General Electric Company. Compact vibration damper for a hermetic refrigerant compressor. 4,043,432, Cl. 188-1.00B.
Schering Corporation: *See—*
Daniels, Peter J. L.; and Turner, William N., 4,044,123, Cl. 424-180.000.
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Schibler, Luzius: *See—*
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Schicker, Otto: *See—*
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Schiffer, Gunter, to Kleinewefers Industrie-Companie GmbH. Sealing arrangement for pressure containers, especially for the treatment of webs of textile goods. 4,043,157, Cl. 68-5.00E.
Schiller Industries, Inc.: *See—*
Allison, William, 4,044,283, Cl. 318-128.000.
Schiller, Raymond Paul. Asphalt cutter. 4,043,601, Cl. 299-36.000.
Schiron, Dieter, to Continental Gummi-Werke Aktiengesellschaft. Loading plate structure adapted to be stacked. 4,043,462, Cl. 214-10.50R.
Schlag, Johannes: *See—*
Wurmb, Rolf; Kunde, Joachim; Schlag, Johannes; and Dorst, Hans Georg, 4,043,971, Cl. 260-40.00R.
Schlappi, Hans, to Metallprodukte A.G. Grenchen. Timepiece comprising a flat display device exposed through an opening in a case. 4,043,116, Cl. 58-88.00R.
Schlicht, Raymond C.: *See—*
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Schlosser, Vernon I. Reactor jet pump plugs. 4,043,705, Cl. 417-151.000.
Schlumberger Technology Corporation: *See—*
Glotin, Bernard Jean-Pierre, 4,043,390, Cl. 166-215.000.
Schmidt, Andreas; Peterson, Janet B.; and Dexter, Martin, to Ciba-Geigy Corporation. Hydroxyphenylated hydantoins. 4,044,019, Cl. 548-313.000.
Schmidt, Ester, admini:tratrix and sole heir: *See—*
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Schmidt, Gerhard Martin Julius, deceased (by Schmidt, Ester, administratrix and sole heir); Dror, Michael; Friedman, Gad; and Levine, Harold H., to Yeda Research & Development Co., Ltd. Polyimides. 4,043,978, Cl. 260-47.0CP.
Schmidt, Karl-Heinz: *See—*
Reif, Hans-Heinrich; Wehner, Klaus; Welker, Jurgen; Schmidt, Karl-Heinz; Schnick, Waltraud; Widmann, Lutz; Schicker, Otto; Seidel, Gunter; Kalb, Karsten; Dollase, Wolfhard; Furtig, Helmut; Hose, Werner; Roscher, Wolfgang; Hadicke, Udo; Knoll, Herbert; Seidel, Rudiger; Nemitz, Gunter; Sturmer, Edith; and Kaiser, Manfred, 4,043,938, Cl. 252-412.000.
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Schmidt, Oskar. Apparatus for molding pneumatic vehicular tires. 4,043,725, Cl. 425-542.000.
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Schmidt, Peter: *See—*
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Schmidt, Walter A., to General Electric Company. Mobile chair for panoramic dental x-ray machine. 4,044,265, Cl. 250-439.00P.
Schmidt, Walter Richard, to Burlington AG. Method of producing pile or plush goods on double-bed circular knitting machines by means of plush hooks. 4,043,151, Cl. 66-9.00R.
Schmidt, William L.: *See—*
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Schmittou, Louis A. Tube compressor. 4,043,172, Cl. 72-402.000.
Schneible Company: *See—*
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Schneider, Karl W.: *See—*
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Schneider, Richard S.; and Gould, Steven J., to Syva Company. Oxazepam derivatives for immunoassay reagents. 4,043,989, Cl. 260-112.00R.
Schneider, Ronald A., to Chevron Research Company. Process for producing a mixed oxide of vanadium and phosphorus having an improved intrinsic surface area. 4,043,943, Cl. 252-437.000.
Schneider, Wilhelm: *See—*
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Schnick, Waltraud: *See—*
Reif, Hans-Heinrich; Wehner, Klaus; Welker, Jurgen; Schmidt, Karl-Heinz; Schnick, Waltraud; Widmann, Lutz; Schicker, Otto; Seidel, Gunter; Kalb, Karsten; Dollase, Wolfhard; Furtig, Helmut; Hose, Werner; Roscher, Wolfgang; Hadicke, Udo; Knoll, Herbert; Seidel, Rudiger; Nemitz, Gunter; Sturmer, Edith; and Kaiser, Manfred, 4,043,938, Cl. 252-412.000.
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Schottle, Helmut August Michael; and Strobel, Karl-Heinz Harry, to Adrema Pitney Bowes GmbH. Printing device. 4,043,264, Cl. 101-269.000.

Schrauzer, Gerhard N.: *See*—
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Schrecongost, Ray B.; and Perutis, Edward J., to Hammond Corporation. Electronic musical instrument keyboard. 4,043,244, Cl. 84-423.000.

Schreyer, Kenneth D., to Columbus McKinnon Corporation. Chain hoist. 4,043,538, Cl. 254-168.000.

Schroder, Helmut, to Vereinigte Aluminium-Werke Aktiengesellschaft. Method and arrangement for separating the material forming one part of an article from that forming another part thereof, particularly for use with metal-synthetic resin composites. 4,043,019, Cl. 29-427.000.

Schroeder, Duane D., to Cutter Laboratories, Inc. Method for isolating albumin using insoluble supports coupled to a dye. 4,043,997, Cl. 260-122.000.

Schubart, Rolf Egon Romnald, to Dorst-Keramikaschinen-Bau Otto Dorst U. Dipl. -Ing. Walter Schlegel. Device for pressing articles such as plates from pulverulent porcelain composition. 4,043,724, Cl. 425-218.000.

Schultz, Everett M.; and Cragoe, Edward J., Jr., to Merck & Co., Inc. Antiinflammatory 2-aminomethyl-6-trihalomethylphenols. 4,044,153, Cl. 424-330.000.

Schulz, Erwin: *See*—
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Schutzer, Gerhard, to Gustav F. Gerdts KG. Oil spraying device. 4,043,425, Cl. 184-55.00A.

Schwan, Thomas J., to Morton-Norwich Products, Inc. 1-[2-Hydroxy-3-(2-naphthoxy)propyl]-2(1H)pyrimidone hydrochloride. 4,044,008, Cl. 260-251.00R.

Schwartz, Abraham: *See*—
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Scientific Engineering, Inc.: *See*—
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Scorpio Industries, Inc.: *See*—
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Scott, John William: *See*—
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Scott, Winfield B. Pipe holding tool. 4,043,139, Cl. 61-105.000.

Scriven, Roger L.: *See*—
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Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdon of Great Britain and Northern Ireland: *See*—
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Segal, Leon, to Allied Chemical Corporation. Stampable thermoplastic sheet reinforced with multilength fiber. 4,044,188, Cl. 428-283.000.

Segar, William R.; and Larson, Robert A., to Westinghouse Electric Corporation. Support apparatus for electrically conductive rail. 4,043,436, Cl. 191-32.000.

Seha, Zdenek, to Ciba-Geigy Corporation. Process for the manufacture of N-alkylamino- and N,N-dialkylaminoanthraquinones. 4,044,030, Cl. 260-378.000.

Seib, Paul A.: *See*—
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Seider, Seymour, to B.S.C. Industries Corporation. Combustion control system. 4,043,743, Cl. 431-76.000.

Seinecke, Siegfried, to Siemens Aktiengesellschaft. Coaxial 2-of-n relay transfer switch having reed contacts. 4,044,319, Cl. 333-7.00R.

Seinecke, Siegfried, to Siemens Aktiengesellschaft. Coaxial 1 of N relay transfer switch having reed contacts. 4,044,320, Cl. 333-7.00R.

Seino, Tadashi, to Mikuni Kogyo Kabushiki Kaisha. Lubricating oil pump. 4,043,711, Cl. 417-469.000.

Seitzer, Walter H.: *See*—
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Seki, Masao; Kito, Hidetoshi; and Yoshino, Masaki, to Rank Xerox Ltd. Method of preventing multi-sheet feeding. 4,043,233, Cl. 83-23.000.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
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Sekiya, Takuzo: *See*—
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Selfridge, Eugene W.: *See*—
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Selfridge, Leroy K., to Selfridge, Eugene W. Symmetrical wallpaper trimmer. 4,043,038, Cl. 30-293.000.

Sellstedt, John H.; Guinosso, Charles J.; and Begany, Albert J., to American Home Products Corporation. 1H-tetrazole-5-carboxamides. 4,044,144, Cl. 424-269.000.

Senco Products, Inc.: *See*—
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Senior, Robert B.; and Karasinski, Frederick, to Gardner-Denver Company. Cutting and insulation stripping apparatus for twisted wire pair. 4,043,362, Cl. 140-1.000.

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Sessions, Byron J. Oil slick retaining boom for off-shore oil wells. 4,043,131, Cl. 61-1.00F.

Sessions, Douglas Charles, to Motorola, Inc. Solid state ignition system and method for linearly regulating the dwell time thereof. 4,043,302, Cl. 123-117.00R.

Sette, Robert A.: *See*—
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Setzer, William C.: *See*—
Sperry, Philip R.; Setzer, William C.; and Damon, Lloyd E., 4,043,840, Cl. 148-32.000.

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Sharowsky, Robert: *See*—
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Shatila, Mounir A.; Von Der Lieth, William H.; Veeneman, John L.; and Thomas, Marion E., to Ampco Foods Inc. Method for forming dough barrier. 4,044,163, Cl. 426-502.000.

Shatto, Walter Clifton, Jr.: *See*—
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Shaw, Alexander F., IV. Chiropractic analytic technique with a liquid crystal sheet. 4,043,324, Cl. 128-2.00H.

Shea, Frank Joseph. Retractable ramp for lifting objects into a vehicle. 4,043,468, Cl. 214-85.000.

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Shell Oil Company. *See*—
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Shell Sekiyu Kabushiki Kaisha: *See*—
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Shelledy, Frank B.: *See*—
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Shelly, Robert S.: *See*—
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Sherlock, Margaret H., to Schering Corporation. Trityl picolinic acid derivatives and their use as anti-acne agents. 4,044,140, Cl. 424-266.000.

Sherman, Larry P. Fireplace chimney furnace. 4,043,313, Cl. 126-121.000.

Sherman, Patsy O.; and Smith, Samuel, to Minnesota Mining and Manufacturing Company. Carpet treating and treated carpet. 4,043,964, Cl. 260-29.60F.

Sherman, Roger M., to MAC Corporation. Method and apparatus for reversibly powering a mobile irrigation system. 4,043,505, Cl. 239-11.000.

Shiba, Haruo: *See*—
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Shimamura, Isao; and Iwano, Haruhiko, to Fuji Photo Film Co., Ltd. Process for treating waste photographic processing solutions. 4,043,907, Cl. 210-32.000.

Shimano, Masaru; and Aizawa, Iwao, to Hitachi, Ltd. Automatic waveform equalizing system for television receiver. 4,044,381, Cl. 358-160.000.

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shiki Kaisha. Method and apparatus for adjusting vibration frequency of vibrating object. 4,044,239, Cl. 235-151.300.
Shirai, Yukio: *See*—
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Shiraki, Hachio: *See*—
Koike, Yoshiyasu; Shiraki, Hachio; Suzuki, Eigen; and Yoshida, Makoto, 4,043,028, Cl. 29-599.000.
Shirey, Frank W., to Westinghouse Air Brake Company. Manually, pneumatically, or electrically operable drain valve device. 4,043,353, Cl. 137-204.000.
Shorter, Myron L., Jr. Appatatus for connecting floating docks. 4,043,287, Cl. 114-266.000.
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Shuck, Lowell Z., to United States of America, Energy Research and Development Administration. Apparatus for providing directional permeability measurements in subterranean earth formations. 4,043,192, Cl. 73-155.000.
Shuler, Kurt E.; and Schrauzer, Gerhard N., to University of California, The Regents of the. Catalyst and method for oxidizing reducing gases. 4,043,934, Cl. 252-186.000.
Shulski, Anton P., to NCR Corporation. Multiplexed segmented character display. 4,044,280, Cl. 315-169.0TV.
Sidro KG Ludwig Moller Fabrik fur Rohrbogen: *See*—
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Siebert, Hans-Werner, to Granges Oxelosunds Jarnverk AB. Device for non-destructive testing of rolled steel plate and the like. 4,043,185, Cl. 73-67.700.
Siebert, Larry D., to KMS Fusion, Inc. Temperature control for apodizers. 4,043,635, Cl. 350-160.00R.
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Signorelli, Louis; and Geoffroy, Alain Yves Louis Marcel, to Societe Nationale Industrielle Aerospatiale. Method and device for controlling disc brakes. 4,043,607, Cl. 303-100.000.
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Silverberg, Morton, to Xerox Corporation. Display system. 4,043,654, Cl. 355-3.00P.
Silverberg, Morton, to Xerox Corporation. Photoelectrophoretic image reproduction device. 4,043,655, Cl. 355-3.00P.
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Simmonds Precision Products, Inc.: *See*—
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Simon, Irvin C., to Union Carbide Corporation. Apparatus for applying torque to electrodes. 4,044,199, Cl. 13-18.000.
Simpson, Alden H. Pressure accumulator. 4,043,352, Cl. 138-31.000.
Singer, Arrigo, to Toolmatic Corporation. X-Y control for radial arm and headstock of a radial drilling machine. 4,043,700, Cl. 408-237.000.
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Sizgorich, Anthony T.: *See*—
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Skarbo, Roald R.; Peterson, Hal D.; and Morin, Edmond A., to Kennecott Copper Corporation. Selective solvent extraction process for copper from nickel. 4,043,882, Cl. 204-106.000.
Skaria, Arankathu; and Stark, Reiner, to Swiss Aluminium Ltd. Process for the manufacture of a compacted synthetic flux based on calcium fluoride. 4,043,803, Cl. 75-257.000.
Skilbreid, Ottar Asbjorn: *See*—
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Sklar, Alan L., to J. Sklar Mfg. Co., Inc. Instrument sterilizing pin. 4,043,754, Cl. 21-82.00R.
Sklar, S. Harvey. Method of treating herpes virus hominis infections. 4,044,122, Cl. 424-180.000.
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Skyline Industries, Inc.: *See*—
Airhart, Tom P., 4,043,074, Cl. 43-18.0GF.
Skytrends, Inc.: *See*—
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Slaton, Stewart E. Conduit molding machine. 4,043,723, Cl. 425-186.000.
Sleger, Roger R., to Ampex Corporation. Damped solenoid. 4,044,323, Cl. 335-240.000.
Sliski, Chester, to Victaulic Company of America. Flapper check valve. 4,043,358, Cl. 137-512.100.
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Smith, Duane R., to Caterpillar Tractor Co. Wheel rim assembly and method for demounting a tire therefrom. 4,043,374, Cl. 152-405.000.
Smith, James Thomas: *See*—
Lafferty, William Daniel; Smith, James Thomas; and Rench, Nicholas Wayne, 4,043,716, Cl. 425-6.000.
Smith, John F., to Narco Scientific Industries, Inc. Automatic squelch circuit with hysteresis. 4,044,309, Cl. 325-478.0o0.
Smith, Lonnell E. Air car. 4,043,421, Cl. 180-117.000.
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Smith, Richard L.: *See*—
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Smith, Samuel: *See*—
Sherman, Patsy O.; and Smith, Samuel, 4,043,964, Cl. 260-29.60F.
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Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,044,017, Cl. 260-295.0AM.
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Smiths Industries Limited: *See*—
McDonald, Thomas V.; and Witts, Stephen D., 4,044,208, Cl. 200-51.090.
Snitzer, Elias, to American Optical Corporation. Means for producing and amplifying optical energy. 4,044,315, Cl. 331-94.50F.
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Snyder, Carl E., Jr.; and Tamborski, Christ, to United States of America, Air Force. Lubricant composition. 4,043,926, Cl. 252-49.900.
Snyder, Paul W., Jr.: *See*—
Anderson, Conroy D.; Schatz, Klaus W.; and Snyder, Paul W., Jr., 4,043,899, Cl. 208-161.000.
Snyder, Richard C., to Pullman Incorporated. Railway car nailable door post. 4,043,274, Cl. 105-409.000.
Societa' Italiana Resine S.I.R. S.p.A.: *See*—
Ackermann, Jacob; Radici, Pierino; Santini, Umberto; and Colombo, Paolo, 4,043,873, Cl. 203-46.000.
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Societe Anonyme de Telecommunications: *See*—
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Soldner, Richard; and Walz, Alfred, to Siemens Aktiengesellschaft. Arrangement for ultrasonic-echo encephalography. 4,043,321, Cl. 128-2.00V.

Solomon, Richard L., to Ecolaire Inc. Air lock filter system. 4,043,775, Cl. 55-302.000.
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Sommervold, David E., to Hycel, Inc. Calibration in an automatic chemical testing apparatus. 4,043,756, Cl. 23-230.00R.
Sorlie, Donald Thomas; and Bucher, David Hoffer, to Deere & Company. Dual packer wheel unit for tillage apparatus. 4,043,281, Cl. 111-85.000.
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Sosin, Boleslaw Marian, to Marconi Company Limited, The. Frequency synthesizers. 4,044,314, Cl. 331-1.00A.
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Bickford, David Edward; Southard, Robert Keith; Sucheski, Matthew Michael; and Wagner, Earl William, 4,043,494, Cl. 226-109.000.
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Spadea, Gregorio, to National Semiconductor Corporation. Self-aligned CMOS process for bulk silicon and insulating substrate device. 4,043,025, Cl. 29-571.000.
Spangler, Paul Joseph, to International Telephone and Telegraph Corporation. Terminal applicator apparatus for terminals in strip form. 4,043,032, Cl. 29-628.000.
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Daly, Edward J.; Sparks, Richard; and Spencer, George R., 4,044,318, Cl. 333-1.000.
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Spears, Wayne. Groove molding method. 4,044,092, Cl. 264-318.000.
Speck, Reinhold; and Forberger, Stefan, to Georg Fischer Aktiengesellschaft. Apparatus for spray-coating internal surfaces of tubular articles. 4,043,295, Cl. 118-317.000.
Speir, Donald W.; and McHugh, Donald P., to General Electric Company. Articulated plug nozzle. 4,043,508, Cl. 239-265.190.
SPEM: Societa Prodotti Elettronici Meccanici: *See—*
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Spence, John R., to Rockwell International Corporation. Memory cell output driver. 4,044,335, Cl. 364-900.000.
Spencer, Arthur T.; and Siranovich, Stanley F., to Mobil Oil Corporation. Process for producing methylolated amide copolymers in concentrated organic solvent solution. 4,043,968, Cl. 260-33.40R.
Spencer, George R.: *See—*
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Spencer, William H.; Dorius, John O.; and Brown, James D., to Trend Ceilings Systems Co. Modular ceiling system. 4,043,689, Cl. 403-252.000.
Sperry, Philip R.; Setzer, William C.; and Damon, Lloyd E., to Swiss Aluminium Ltd. Aluminum alloys possessing improved resistance weldability. 4,043,840, Cl. 148-32.000.
Sperry Rand Corporation: *See—*
Kochel, Leroy Joseph, 4,043,889, Cl. 204-192.00R.
Watkins, Lee A.; and Jacob, Larry M., 4,044,387, Cl. 360-61.000.
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Splittstoesser, Clair D.: *See—*
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Sporck, Christian R., to National Semiconductor Corporation. Casting compound for semiconductor devices. 4,043,969, Cl. 260-37.0EP.
Sprunck, Emile. Blast furnace tuyere. 4,043,541, Cl. 266-268.000.
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Square D Company: *See—*
Rayburn, Donald Lee; Sunday, Larry Ray; and Larsen, Edgar Robert, 4,044,214, Cl. 200-316.000.
Stageboe, Jan; and Einstabland, Tomas Berge, to Ingenior F. Selmer A/S. Offshore foundation structure. 4,043,138, Cl. 61-88.000.
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Standard Oil Company: *See—*
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Standard Products Company, The: *See—*
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Stangeland, Maynard L., to Rockwell International Corporation. Shear flexibility for structures. 4,044,186, Cl. 428-167.000.
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Star, Scott Clifford. Magnetic maze game. 4,043,558, Cl. 273-110.000.
Stark, Bernard Peter; and Thoseby, Michael Robert, to Ciba-Geigy Corporation. Electrically-conductive resins, and intermediates for their preparation. 4,043,983, Cl. 260-65.000.
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Starnes, R. Emory: *See—*
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Baker, Don R., 4,044,025, Cl. 260-332.100.
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Steele, Clarence R.: *See—*
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Steenhoek, Arie; and Olsman, Herman, to Lever Brothers Company. Flavored fat composition. 4,044,168, Cl. 426-613.000.
Steer, Ronald John, to Lucas Industries Limited. Compound pinions for use in epicyclic gear boxes. 4,043,216, Cl. 74-410.000.
Stegherr, Rudolf; and Ruecker, Gerhard, to Motoren- und Turbinen-Union Munchen GmbH M.A.N. Maybach Mercedes-Benz. Shaft coupling. 4,043,146, Cl. 64-1.00V.
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Stepansky, Daniel Marion. Puzzle and method of playing same. 4,043,561, Cl. 273-153.00P.
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Stites, Francis H.; and Weir, Colin B., to GTE Sylvania Incorporated. Communication transmitting apparatus with carrier level control. 4,044,308, Cl. 325-144.000.

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Stohr, Jean-Francois: *See—*
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Stone, Alan J., administrator: *See—*
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Stone Construction Equipment, Inc.: *See—*
Stone, Guthrie B., deceased, 4,043,540, Cl. 259-171.000.

Stone, Guthrie B., deceased (by Stone, Alan J., administrator), to Stone Construction Equipment, Inc. Mixer paddle assembly and drive system. 4,043,540, Cl. 259-171.000.

Stonehocker, Clara Francis. Expandable pot for containing plants and method therefor. 4,043,077, Cl. 47-66.000.

Straus, Alan E.: *See—*
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Strew, Mitchell, to Illinois Range Company. Hood assembly for cooking ranges. 4,043,320, Cl. 126-299.00E.

Strobel, Karl-Heinz Harry: *See—*
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Stromberg-Carlson Corporation: *See—*
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Stumpp, Gerhard; Eckert, Konrad; Runge, Detlev; and Wessel, Wolf, to Robert Bosch GmbH. Fuel injection system for self-igniting internal combustion engines. 4,043,304, Cl. 123-119.00A.

Stunkel, Helmut: *See—*
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Sturmer, Edith: *See—*
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Stutz, Andreas, to Mettler Instrumente AG. Weighing scale with compensating weights. 4,043,414, Cl. 177-248.000.

Suarez, Richard A., to Consumer Publishing Company, Inc. Eccentric rotatable weight exercising device. 4,043,553, Cl. 272-128.000.

Sucheski, Matthew Michael; and Wagner, Earl William, to AMP Incorporated. Method and apparatus for connecting conductors to terminals in connectors. 4,043,034, Cl. 29-749.000.

Sucheski, Matthew Michael: *See—*
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Suda, Hideaki; Dohgane, Iwao; and Hosaka, Hirokazu, to Sumitomo Chemical Company, Limited. Process for recovery of urea from its phenolic solution. 4,044,052, Cl. 260-96.50C.

Suda, Minoru. Centerless grinding machine using tangential-feed method. 4,043,767, Cl. 51-103.0WH.

Sullivan, Kevin J.: *See—*
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Tsukada, Tameyasu; Sumi, Yoshio; Moriwaki, Yoshinaga; Oshio, Hirosuke; Ueda, Katsunobu; and Umino, Yoiti, 4,043,618, Cl. 308-174.000.

Sumikin-Kiko Co., Ltd.: *See—*
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Sumitomo Aluminum Smelting Co., Ltd.: *See—*
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Sumitomo Chemical Company, Limited: *See—*
Hamma, Noritaka; Fukumura, Masataka; Maeshima, Kaoru; and Nakagome, Takenari, 4,043,991, Cl. 260-112.50R.
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Sun Oil Company Limited: *See—*
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Sun Oil Company of Pennsylvania: *See—*
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Sun Ventures, Inc.: *See—*
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Sun, Yen Sheng Edmund, to General Electric Company. Method of manufacturing semiconductor devices. 4,043,836, Cl. 148-1.500.

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Watanabe, Kiyoshi; Sunahara, Kazuo; Terao, Motoyasu; and Fujita, Tsutomu, 4,043,748, Cl. 432-253.000.

Sunday, Larry Ray: *See—*
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Sundberg, Michael W.: *See—*
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Sundeen, Joseph E.: *See—*
Hauck, Frederic Peter; Reid, Joyce; Narayanan, Venkatachala L.; Cimarusti, Christopher M.; Haugwitz, Rudiger D.; and Sundeen, Joseph E., 4,044,040, Cl. 260-456.00P.

Sundstrand Corporation: *See—*
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Surface Technology Corporation: *See—*
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Suverison, Lyle B.; and Beck, William R., to General Motors Corporation. Molded electrical connector. 4,043,630, Cl. 339-218.00M.

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Suzuki, Katsuya: *See—*
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Suzuki, Manao, to Kyokado Engineering Co., Ltd. Method of consolidating poor quality soils. 4,043,830, Cl. 106-287.0SS.

Suzuki, Mikio: *See—*
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Suzumura, Yoshikazu: *See—*
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Svensson, Karl Ernst, to Aktiebolaget Optimus. Base or stand for a camping stove. 4,043,744, Cl. 431-142.000.

Swackhamer, Stanley B., to Xerox Corporation. Magnetic toner scavenging system. 4,043,298, Cl. 118-652.000.

Swanson, Carl Loyal W., deceased: *See—*
McCoy, Frederick C.; and Swanson, Carl Loyal W., deceased, 4,044,118, Cl. 424-200.000.

Swanson, Sydney Alan Vasey; and Roper, Brian Arnold, to National Research Development Corporation. Endoprosthetic shoulder joint device. 4,042,980, Cl. 3-1.910.

Swanson, Viola C., executrix: *See—*
McCoy, Frederick C.; and Swanson, Carl Loyal W., deceased, 4,044,118, Cl. 424-200.000.

Swearengin, Ronald I.: *See—*
Dyche, Kenneth I.; Knox, J. Paul; and Swearengin, Ronald I., 4,043,078, Cl. 49-220.000.

Swede, Harald Georg: *See—*
Olsson, Willy John; and Swede, Harald Georg, 4,043,520, Cl. 242-58.100.

Swift & Company: *See—*
Donnelly, Thomas H.; and McGinnis, Robert S., 4,043,996, Cl. 260-118.000.
Erickson, David R.; and Tompkin, Robert B., 4,044,160, Cl. 426-330.000.
Wilding, Morris D., 4,044,157, Cl. 426-250.000.

Swift, Roderick D., to United States of America, Army. Method to observe damage induced in optical elements by intense thermal radiation. 4,043,177, Cl. 73-15.00R.

Swinbanks, Malcolm Alexander, to National Research Development

Corporation. Active control of sound waves. 4,044,203, Cl. 179-1.00P.

Swinehart, Carl F.: *See—*
Moss, Robert H.; Swinehart, Carl F.; and Spicuzza, William F., 4,044,112, Cl. 423-490.000.

Swiss Aluminium Ltd.: *See—*
Skaria, Arankathu; and Stark, Reiner, 4,043,803, Cl. 75-257.000.
Sperry, Philip R.; Setzer, William C.; and Damon, Lloyd E., 4,043,840, Cl. 148-32.000.

Symanski, Jerome J.; and Keefer, Russell L., to United States of America, Navy. Monolithic NTDS driver and receiver. 4,044,271, Cl. 307-262.000.

Symons Corporation: *See—*
Connors, Frank T., 4,043,087, Cl. 52-127.000.

Syntex (U.S.A.) Inc.: *See—*
Marx, Michael; and Reisdorff, Josef H., 4,044,020, Cl. 548-303.000.

Synthelabo: *See—*
Najer, Henry; Dupont, Regis; and Giudicelli, Don Pierre Rene Lucien, 4,044,132, Cl. 424-250.000.

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Blakemore, Judith I.; Leute, Richard K.; and Ernst, Roberta D., 4,043,872, Cl. 195-103.50A.
Schneider, Richard S.; and Gould, Steven J., 4,043,989, Cl. 260-112.00R.

Szabo, Emery, to Tenneco Chemicals, Inc. Stabilized vinyl halide resin compositions. 4,043,957, Cl. 260-23.0XA.

Szabo, Lajos: *See—*
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Szabo, Lester J.: *See—*
Barner, Herbert E.; Davies, David S.; and Szabo, Lester J., 4,044,094, Cl. 423-32.000.

Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar Rt. Indolaquinolizidine derivatives. 4,044,012, Cl. 260-293.530.

Szekely, Akos: *See—*
Trumble, John H.; Ehlert, Thomas C.; and Szekely, Akos, 4,043,314, Cl. 126-263.000.

Szporny, Laszlo: *See—*
Karpati, Egon; Szporny, Laszlo; Bartok, Mihaly; Czombos, Jozsef; Felfoldi, Karoly; Laszlavik, Marta; and Notheisz, Ferenc, 4,044,146, Cl. 424-283.000.
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Tachibana, Katsuhiko: *See—*
Sakamoto, Eiichi; Kubo, Masanobu; Yasui, Takashi; Suzuki, Katsuya; and Tachibana, Katsuhiko, 4,043,801, Cl. 75-60.000.

Taguchi, Masahiro: *See—*
Hattori, Yoshiyuki; Suzuki, Mikio; and Taguchi, Masahiro, 4,043,572, Cl. 280-738.000.

Takacs, Gyorgy: *See—*
Erodi, Gyorgy; Gorondi, Istvan; Kovacs, Laszlo; and Takacs, Gyorgy, 4,043,170, Cl. 72-364.000.

Takagi, Hitoshi: *See—*
Hisamatsu, Tokuichi; Kitamura, Taketsugu; Saito, Takeshiro; Takagi, Hitoshi; and Sekiya, Takuzo, 4,044,101, Cl. 423-235.000.

Takagi, Katsuhide, to Sankyo Kogaku Kogyo Kabushiki Kaisha. Film counter for use with a portable cine-camera. 4,043,648, Cl. 352-72.000.

Takahashi, Akira, to Fulton Electronic Industry, Ltd. Cassette tape recorders. 4,044,391, Cl. 360-96.000.

Takano, Tetsuo. Electric switches and process and apparatus for manufacture thereof. 4,044,212, Cl. 200-283.000.

Takao, Masami: *See—*
Furuta, Isao; Tamura, Hiroshi; and Takao, Masami, 4,044,111, Cl. 423-351.000.

Takase, Tsuneo; and Yamaguchi, Tetsuo, to Tokyo Shibaura Electric Co., Ltd. Circuits for setting the display mode and the correction mode of electronic timepieces. 4,043,114, Cl. 58-23.00R.

Takeda Chemical Industries, Ltd.: *See—*
Kuwada, Yutaka; Meguro, Kanji; Natsugari, Hideaki; Sato, Yoshiaki; and Tawada, Hiroyuki, 4,044,129, Cl. 424-248.560.

Takeda, Tsuneshi; Atarashi, Yasuyuki; and Mori, Akira, to Kao Soap Co., Ltd. Waste water treatment method. 4,043,904, Cl. 210-28.000.

Takenaka Komuten Co., Ltd.: *See—*
Endo, Masaaki; Miura, Mitsuo; Kukino, Yoshinori; Kikuchi, Kimio; and Aoyagi, Hayao, 4,043,909, Cl. 210-49.000.

Takenaka, Yoshisuke; and Hori, Kikuo, to Teijin Limited. Spinning apparatus with retractable suction gun. 4,043,718, Cl. 425-72.00S.

Takeshita, Masahiro: *See—*
Muraki, Ryoji; Endo, Masao; Aoki, Nobuaki; and Takeshita, Masahiro, 4,044,102, Cl. 423-239.000.

Takezaki, Shusuke: *See—*
Otsuki, Yukio; Matsumoto, Hiroyuki; Ito, Hiroshi; and Takezaki, Shusuke, 4,044,217, Cl. 219-76.000.

Takimoto, Yasuyuki: *See—*
Nishimura, Masakatsu; Saito, Shin; Tanabe, Kunsei; Umeda, Yasusi; Arimatsu, Seiji; and Takimoto, Yasuyuki, 4,044,385, Cl. 358-300.000.

Talsma, Herbert; and Giffen, William M., Jr., to Standard Oil Company. Impact improvement of rubber-modified nitrile resins. 4,043,947, Cl. 260-23.70M.

Tamborski, Christ: *See—*
Snyder, Carl E., Jr.; and Tamborski, Christ, 4,043,926, Cl. 252-49.900.

Tammen, Heinrich: *See—*
Kramann, Bernhard; and Tammen, Heinrich, 4,043,345, Cl. 128-349.00R.

Tamura, Hiroshi: *See—*
Furuta, Isao; Tamura, Hiroshi; and Takao, Masami, 4,044,111, Cl. 423-351.000.

Tamura, Motohiko: *See—*
Nishino, Mutsumi; Sasaki, Hideo; Uda, Kazumi; Tamura, Motohiko; Hiyama, Kunihiko; and Fujiike, Hiroshi, 4,043,769, Cl. 55-25.000.

Tanabe, Kunsei: *See—*
Nishimura, Masakatsu; Saito, Shin; Tanabe, Kunsei; Umeda, Yasusi; Arimatsu, Seiji; and Takimoto, Yasuyuki, 4,044,385, Cl. 358-300.000.

Tanaka, Hironari: *See—*
Matsuyama, Sigeru; Tanaka, Hironari; Koyama, Masaharu; and Ishibashi, Tadashi, 4,043,639, Cl. 350-160.0LC.

Tanaka, Kojiro, to Kabushiki Kaisha Daini Seikosha. An electronic timepiece having a battery voltage monitor. 4,043,112, Cl. 58-23.0BA.

Tanaka, Taro: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Taro; and Fujisawa, Hideya, 4,043,307, Cl. 123-139.0AW.

Tanaka, Yoshinobu, to Alpha Techno Company. Child-proof container. 4,043,448, Cl. 206-1.500.

Tanara, Giovanni, to Ice Cream Engineering di G. Tanara & C. S.a.s. Automatic ice cream manufacturing machine. 4,044,161, Cl. 426-421.000.

Tanczyn, Harry, to Armco Steel Corporation. Abrasion resistant, heat hardenable, stainless steel. 4,043,843, Cl. 148-37.000.

Tange, Fumiko. Binding device for bundling openings of bags or the like. 4,043,363, Cl. 140-93.00A.

Tanner, David John, to Linwo Industries Ltd. Artificial fireplace logs with ignition strips. 4,043,765, Cl. 44-14.000.

Tanner, Herbert: *See—*
Bertram, Heidrun; Fahnenstich, Rudolf; and Tanner, Herbert, 4,044,169, Cl. 426-656.000.

Tanner, Jesse H. Wind shear warning system. 4,043,194, Cl. 73-178.00T.

Tarrant Manufacturing Company: *See—*
Tarrant, William P., 4,043,446, Cl. 198-728.000.

Tarrant, William P., to Tarrant Manufacturing Company. Conveyor. 4,043,446, Cl. 198-728.000.

Tautz, Jurgen: *See—*
Irion, Leonhard; Tautz, Jurgen; and Ulrych, Gerhard, 4,043,868, Cl. 176-50.000.

Tawada, Hiroyuki: *See—*
Kuwada, Yutaka; Meguro, Kanji; Natsugari, Hideaki; Sato, Yoshiaki; and Tawada, Hiroyuki, 4,044,129, Cl. 424-248.560.

Taylor, Allen L.; and Ensign, Thomas C., to Minnesota Mining and Manufacturing Company. Electromagnetic radiation detector with large area sensing medium. 4,044,251, Cl. 250-342.000.

Taylor, Derek, to Bunker Ramo Corporation. Trimming potentiometers with coarse and fine adjustment means. 4,044,327, Cl. 338-166.000.

Taylor, Frederick P., to Lipe-Rollway Corporation. Torque limiting clutch brake. 4,043,437, Cl. 192-13.00R.

Taylor, John Bodenham; and Harrison, Derek Ralph, to Roussel Uclaf. 1,2-Dihydro-6-phenyl-1H,4H-imidazobenzodiazepin-1-ones. 4,044,142, Cl. 424-250.000.

Taywood Seltrust Offshore: *See—*
Wilkins, John William, 4,043,407, Cl. 175-50.000.

TDK Electronics Co., Ltd.: *See—*
Satou, Takateru; and Shiba, Haruo, 4,044,386, Cl. 360-60.000.

Teche, Andre: *See—*
Hainaut, Daniel; Demoute, Jean-Pierre; and Teche, Andre, 4,043,796, Cl. 71-98.000.

Technicon Instruments Corporation: *See—*
Farrell, Gregory A.; and Gordon, Abraham, 4,043,678, Cl. 356-246.000.

Technology Incorporated: *See—*
Trageser, James H., 4,043,196, Cl. 73-204.000.

Tedeschi, Rinaldo Robert, to United Technologies Corporation. Engine, cylinder identification (CID) transducer. 4,043,189, Cl. 73-117.300.

Teijin Limited: *See—*
Ishida, Kinyu; Gose, Kenji; Matsunami, Shigeo; Sigeoka, Miyoyuki; and Matsumura, Teruichi, 4,043,097, Cl. 53-52.000.
Takenaka, Yoshisuke; and Hori, Kikuo, 4,043,718, Cl. 425-72.00S.

Teijin Seiki Co., Ltd.: *See—*
Ishida, Kinyu; Gose, Kenji; Matsunami, Shigeo; Sigeoka, Miyoyuki; and Matsumura, Teruichi, 4,043,097, Cl. 53-52.000.

Teitelbaum, Charles Leonard: *See—*
Lando, Frank; and Teitelbaum, Charles Leonard, 4,044,162, Cl. 426-427.000.

Teledyne Isotopes: *See—*
Hall, Samuel D., Jr., 4,043,835, Cl. 136-221.000.

Templet Industries Incorporated: *See—*
Rheingold, Lawrence M., 4,043,301, Cl. 123-52.00B.

Tenneco Chemicals, Inc.: *See—*
Szabo, Emery, 4,043,957, Cl. 260-23.0XA.

Terao, Motoyasu: *See—*
Watanabe, Kiyoshi; Sunahara, Kazuo; Terao, Motoyasu; and Fujita, Tsutomu, 4,043,748, Cl. 432-253.000.

Terner, Leslie L.: *See—*
Noakes, Jack E.; Sato, Hiroshi; and Terner, Leslie L., 4,044,110, Cl. 423-346.000.

Teske, Fritz; and Teske, Lothar. Sliding ring seal. 4,043,619, Cl. 308-187.100.
Teske, Lothar: *See—*
Teske, Fritz; and Teske, Lothar, 4,043,619, Cl. 308-187.100.
Testa, Francesco; and Bigliani, Antonio, to Societa' Italiana Resine S.I.R. S.p.A. Process for separating and recovering the constituents of an exhausted solvent mixture used for cleansing reactors for the polymerization of vinyl chloride. 4,043,874, Cl. 203-47.000.
Texaco Development Corporation: *See—*
Brennan, Michael E.; Moss, Philip H.; and Yeakey, Ernest L., 4,044,053, Cl. 260-583.00P.
Texaco Inc.: *See—*
Franz, William F.; and Hess, Howard V., 4,043,386, Cl. 165-45.000.
Gilmer, William N.; and Barnes, Vernon M., Jr., 4,043,539, Cl. 259-4.0AB.
Higgs, Kenneth O.; and Marsch, Lawrence F., 4,043,183, Cl. 73-59.000.
Kudchadker, Mohan Vaikunth; and Walker, Thad Oscar, 4,043,396, Cl. 166-274.000.
McCoy, Frederick C.; and Swanson, Carl Loyal W., deceased, 4,044,118, Cl. 424-200.000.
Morris, David A.; Flournoy, Norman E.; and Langley, Thomas W., 4,043,180, Cl. 73-40.50A.
Palmer, Harold A.; and Sample, Thomas E., Jr., 4,043,922, Cl. 252-8.55D.
Wiley, Morris A.; Schlicht, Raymond C.; and Waldbillig, James O., 4,044,032, Cl. 260-399.000.
Texas Instruments Incorporated: *See—*
Bazin, Bernard, 4,043,848, Cl. 148-187.000.
Birchler, Robert O.; and Williams, E. R., Jr., 4,043,027, Cl. 29-588.000.
Roberts, Charles Grady; Chan, Wayne W.; and Collins, Dean R., 4,044,374, Cl. 357-80.000.
Textilform S.A.: *See—*
Paracchi, Antonio, 4,043,729, Cl. 425-348.00R.
Textron Inc.: *See—*
Wenzel, Robert H.; and Stavros, Franklin O., 4,044,289, Cl. 318-571.000.
Textured Yarn Co., Inc.: *See—*
Stanley, Robert K.; and Schwartz, Ira, 4,043,009, Cl. 28-221.000.
Tezuka, Toshiro: *See—*
Miyoshi, Isao; Abe, Masaru; Tezuka, Toshiro; and Yoshimoto, Toshio, 4,043,372, Cl. 152-354.000.
Th. Goldschmidt AG: *See—*
Rossmy, Gerd, 4,044,038, Cl. 260-448.20P.
Thagard Technology Company: *See—*
Matovich, Edwin, 4,044,117, Cl. 423-659.000.
Thaule, Birger Hellmann, to A/S Kongshavn Industri. Cable-controlled grab device. 4,043,580, Cl. 294-70.000.
Theodore, Ares N.: *See—*
Labana, Santokh S.; and Theodore, Ares N., 4,044,070, Cl. 260-836.000.
Thermo-Couple Products Company, Inc.: *See—*
Finney, Philip F., 4,043,200, Cl. 73-359.00R.
Thermology, Inc.: *See—*
Trumble, John H.; Ehlert, Thomas C.; and Szekely, Akos, 4,043,314, Cl. 126-263.000.
Therrien, Gordon G.: *See—*
Rutten, James B.; Rutten, Peter T.; Therrien, Gordon G.; and Gaylord, Richard S., 4,043,465, Cl. 214-17.0DB.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H. Mobile track tamping machine. 4,043,271, Cl. 104-12.000.
Theurer, Josef: *See—*
Folser, Karl; and Theurer, Josef, 4,043,398, Cl. 171-16.000.
Thomas & Betts Corporation: *See—*
Narozny, Ronald S., 4,043,628, Cl. 339-99.00R.
Thomas, Charles F. Edge finder probe. 4,043,046, Cl. 33-185.00R.
Thomas, Elmer L.: *See—*
Fredriksson, Oke A.; and Thomas, Elmer L., 4,043,175, Cl. 73-1.0DV.
Thomas, Marion E.: *See—*
Shatila, Mounir A.; Von Der Lieth, William H.; Veeneman, John L.; and Thomas, Marion E., 4,044,163, Cl. 426-502.000.
Thomas, William Anthony: *See—*
Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,044,017, Cl. 260-295.0AM.
Thomas, William W.; and Sprunger, Elmore V., to General Electric Company. Two-spool variable cycle engine. 4,043,121, Cl. 60-204.000.
Thor Power Tool Company: *See—*
Dudek, Edmund C., 4,043,222, Cl. 74-606.00R.
Thorpe, Donald H.: *See—*
Cooke, Victor F. G.; and Thorpe, Donald H., 4,043,988, Cl. 260-862.000.
Thoseby, Michael Robert: *See—*
Stark, Bernard Peter; and Thoseby, Michael Robert, 4,043,983, Cl. 260-65.000.
Tichy, Dieter: *See—*
Keil, Karl-Heinz; Keller, Karlfried; Ribka, Joachim; and Tichy, Dieter, 4,043,984, Cl. 260-67.60R.
Tidril Corporation: *See—*
Cherrington, Martin D., 4,043,136, Cl. 61-72.700.
Tidwell, Carl E., Jr. Lightweight trailer construction. 4,043,583, Cl. 296-28.00M.
Tiemann, Reinhard: *See—*
Pakur, Henryk; and Tiemann, Reinhard, 4,043,371, Cl. 152-362.00R.
Tile Council of America, Inc.: *See—*
Bernett, Frank E., 4,043,827, Cl. 106-92.000.
Timken Company, The: *See—*
Otto, Dennis L., 4,043,620, Cl. 308-187.200.
Tinney, Francis John; Nicolaides, Ernest D.; and Campbell, Alfred, to Parke, Davis & Company. New pentapeptides and methods for their production. 4,043,993, Cl. 260-112.5LH.
Tippetts, Kenneth Boyd, to Honeywell Information Systems, Inc. Magazine for a plurality of fixtures holding integrated circuit chips. 4,043,485, Cl. 221-312.00R.
Tiru, Mandayam: *See—*
Blixt, Kjell Gunnar; Tornmarck, Sven Ivan Arvid; Juhlin, Rolf; Salenstedt, Karl Rune; and Tiru, Mandayam, 4,043,871, Cl. 195-99.000.
Tishura, Vladimir Ivanovich: *See—*
Lebedev, Vladimir Konstantinovich; Chernenko, Ivan Alexeevich; Postolaty, Nikolai Ivanovich; Kuchuk-Yatsenko, Sergei Ivanovich; Tishura, Vladimir Ivanovich; Entin, Yakov Borisovich; Filippov, Alexandr Nikolaevich; and Martynov, Evgeny Petrovich, 4,044,219, Cl. 219-100.000.
Tobin, Melvin W.: *See—*
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Toda, Tadahide: *See—*
Konishi, Hiromu; Horie, Mitsuyuki; and Toda, Tadahide, 4,043,123, Cl. 60-397.000.
Toepfl, Rosemarie: *See—*
Abel, Heinz; Toepfl, Rosemarie; and Schibler, Luzius, 4,044,178, Cl. 427-373.000.
Toepsch, Hans: *See—*
deMontigny, Armand; Eichenhofer, Kurt-Wilhelm; Toepsch, Hans; and Schliebs, Reinhard, 4,043,977, Cl. 260-46.5UA.
Tokuda, Makoto: *See—*
Nashiwa, Hajime; Mori, Akiyoshi; and Tokuda, Makoto, 4,043,798, Cl. 75-53.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Suzuki, Yasoji; and Ochii, Kiyofumi, 4,044,342, Cl. 340-173.0DR.
Takase, Tsuneo; and Yamaguchi, Tetsuo, 4,043,114, Cl. 58-23.00R.
Tsukada, Tameyasu; Sumi, Yoshio; Moriwaki, Yoshinaga; Oshio, Hirosuke; Ueda, Katsunobu; and Umino, Yoiti, 4,043,618, Cl. 308-174.000.
Uchida, Yukimasa, 4,044,343, Cl. 340-173.00R.
Toma, Joseph R.; and Johnson, Oliver C., to Astrolab, Inc. Apparatus for forming corrugations of "zero" pitch in coaxial cable. 4,043,161, Cl. 72-78.000.
Tomar Corporation: *See—*
Hoggard, Anthony J., 4,043,020, Cl. 29-427.000.
Tomita, Kazuo; Murakami, Tadashi; Yamazaki, Yoshio; and Honma, Toyokuni, to Sankyo Company Limited. Isoxazolone derivatives, their preparation and their use as plant growth regulators. 4,044,018, Cl. 260-307.00A.
Tomlin, James J., to Commterm Inc. Page power conversion apparatus for battery charging. 4,044,292, Cl. 320-2.000.
Tomomatsu, Kenichi, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Method of measuring surface roughness. 4,043,187, Cl. 73-105.000.
Tompkin, Robert B.: *See—*
Erickson, David R.; and Tompkin, Robert B., 4,044,160, Cl. 426-330.000.
Tonami, Munehiko: *See—*
Fukui, Yutaka; Hataya, Fumio; Sasaki, Ryoichi; Nakajima, Fumito; Matsuda, Shimpei; Tonami, Munehiko; and Hiraga, Ryo, 4,043,945, Cl. 252-466.00J.
Toni Totes of Vermont, Inc.: *See—*
Miner, Antonia V.; and Nichols, Joseph, 4,043,270, Cl. 38-102.910.
Tonseth, Ivar S., Jr.: *See—*
Dix, Joseph; Campbell, Norman; and Tonseth, Ivar S., Jr., 4,043,499, Cl. 228-173.000.
Toolmatic Corporation: *See—*
Singer, Arrigo, 4,043,700, Cl. 408-237.000.
Tornmarck, Sven Ivan Arvid: *See—*
Blixt, Kjell Gunnar; Tornmarck, Sven Ivan Arvid; Juhlin, Rolf; Salenstedt, Karl Rune; and Tiru, Mandayam, 4,043,871, Cl. 195-99.000.
Toshihiro Kondo: *See—*
Kondo, Toshihiro, 4,044,370, Cl. 354-289.000.
Totani, Kazuo: *See—*
Nakamura, Kenji; Jinnai, Toshio; Totani, Kazuo; and Furuta, Shigetaro, 4,043,634, Cl. 350-160.0LC.
Touval, Irving, to M&T Chemicals Inc. Flame retardant compositions and methods for their preparation. 4,044,072, Cl. 260-859.0PV.
Toyama, Satoru: *See—*
Kisuna, Keiichi; Toyama, Satoru; and Kimura, Hiroshi, 4,043,022, Cl. 29-460.000.
Toyo Soda Manufacturing Co., Ltd.: *See—*
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Toyoda, Atsushi: *See—*
Kasai, Yuuji; Ogura, Hironuri; and Toyoda, Atsushi, 4,043,376, Cl. 164-7.000.
Toyoda, Kenji, to Nippon Kogaku K.K. Exposure meter. 4,043,677, Cl. 356-227.000.
Toyoda, Kenji: *See—*
Hamaguchi, Ichiro; and Toyoda, Kenji, 4,044,304, Cl. 324-133.000.

Toyomura, Shigeru: *See—*
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Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
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Kato, Takashi; Hoshi, Koichi; and Nakamura, Norihiko, 4,043,309, Cl. 123-191.0SP.
Konishi, Hiromu; Horie, Mitsuyuki; and Toda, Tadahide, 4,043,123, Cl. 60-397.000.
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Taro; and Fujisawa, Hideya, 4,043,307, Cl. 123-139.0AW.
Ohnuma, Kiyoshi; and Nagano, Syuzi, 4,043,223, Cl. 74-688.000.
Trageser, James H., to Technology Incorporated. Method and apparatus for effecting fluid flow measurement in a single sensor. 4,043,196, Cl. 73-204.000.
Trappenberg, Hans-Joachim: *See—*
Weidhaas, Wolfgang; and Trappenberg, Hans-Joachim, 4,043,026, Cl. 29-592.000.
Traver, Frank J., to General Electric Company. Water based green tire lubricant. 4,043,924, Cl. 252-21.000.
TRE Corporation: *See—*
Conn, Charles E., Jr., 4,043,498, Cl. 228-265.000.
Treadwell, Kenneth; Kushlefsky, Bernard G.; and Russo, Robert V., to M&T Chemicals Inc. Improving the oxidative stability of flexible polyurethane foams. 4,043,949, Cl. 260-2.5AC.
Trend Ceilings Systems Co.: *See—*
Spencer, William H.; Dorius, John O.; and Brown, James D., 4,043,689, Cl. 403-252.000.
Tress, Norwood E.: *See—*
Morrison, Wilbur J.; and Tress, Norwood E., 4,043,551, Cl. 271-243.000.
Tretiakoff, Andree: *See—*
Tretiakoff, Oleg; and Tretiakoff, Andree, 4,044,350, Cl. 340-407.000.
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Triantafyllou, Demetrios. Miniaturized vacuum cleaner device. 4,042,999, Cl. 15-422.000.
Tribotech: *See—*
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Tromovitch, Theodore A. Portable cryosurgical instrument. 4,043,341, Cl. 128-303.100.
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Turbett, Robert J., to Union Carbide Corporation. Insulated wire or cable. 4,044,200, Cl. 174-23.00R.
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Morris, Ralph; and Turner, William Gordon, 4,043,356, Cl. 137-320.000.
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Typographic Innovations Inc.: *See—*
Gullo, Robert, 4,044,290, Cl. 318-640.000.
UBE Industries, Ltd.: *See—*
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Kessler, Milton; and Ullman, Myron E., Jr., 4,043,278, Cl. 108-150.000.
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Larrabee, Edward Whittum; Rawson, Paul Olney; and Yagami, Richard Hajime, 4,043,501, Cl. 229-14.0BE.
Mui, Jeffrey Y. P.; and Pines, Arthur N., 4,044,037, Cl. 260-448.20N.
Prokai, Bela; and Kanner, Bernard, 4,043,951, Cl. 260-2.5AH.
Simon, Irvin C., 4,044,199, Cl. 13-18.000.
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Deering, Roland F., 4,043,897, Cl. 208-11.00R.
Uniroyal, Inc.: *See—*
Graham, Bruce A.; Puttock, Michael A.; Felauer, Ethel E.; and Neidermyer, Robert W., 4,043,792, Cl. 71-78.000.
von Schmeling, Bogislav; and Boos, Walter R., 4,044,139, Cl. 424-263.000.
Whelan, William Paul, 4,043,958, Cl. 260-2.5FP.
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Zimmern, Bernard, 4,043,704, Cl. 417-62.000.
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Durston, John Graham, 4,043,866, Cl. 176-40.000.
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Evans, Leslie Samuel; Bones, Roger John; and Harbar, John Richard, 4,044,191, Cl. 429-104.000.
U.S. Engineering Company, Inc.: *See—*
Rowinski, Anthony S., 4,043,247, Cl. 85-31.000.
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Paul, George W.; Balinski, Henry A.; Quigg, Paul S.; and Crumbaugh, John H., 4,043,092, Cl. 52-712.000.
U.S. Industries, Inc.: *See—*
Van Huis, Robert L., 4,043,256, Cl. 98-1.500.
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Administrator, Environmental Protection Agency: *See—*
Moss, Gerald; Johnes, Graham Lloyd; and Craig, John William Thomas, 4,043,741, Cl. 431-3.000.
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Folk, Craig L., 4,043,004, Cl. 19-200.000.
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Crane, Robert L., 4,044,253, Cl. 250-302.000.
Croce, Richard F.; and Burton, Gardner T., 4,043,653, Cl. 355-2.000.
Eisentraut, Kent J.; and Chattoraj, Shib C., 4,044,116, Cl. 423-658.500.

Gehatia, Matatiahu; and Wiff, Donald R., 4,043,669, Cl. 356-104.000.
Haws, James L.; Quinney, Douglas W.; and Richards, Frank A., 4,044,396, Cl. 361-385.000.
Kennedy, Chandler J., 4,044,316, Cl. 331-94.50S.
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Moore, John H., 4,044,397, Cl. 361-398.000.
Snyder, Carl E., Jr.; and Tamborski, Christ, 4,043,926, Cl. 252-49.900.
Watmough, Thomas; and O'Shea, Robert P., 4,043,808, Cl. 75-126.00E.
Wiebe, David J., 4,043,147, Cl. 64-1.00V.

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Ambrosini, Leonard R., 4,043,269, Cl. 102-87.000.
Au Coin, Thomas R.; Schwartz, Abraham; Gualtieri, John G.; and Wade, Melvin J., 4,043,860, Cl. 156-624.000.
Cowgill, Paul N.; and Pearson, John L., 4,044,237, Cl. 235-150.270.
Hunter, Joe S.; and Little, Little J., 4,043,204, Cl. 73-516.00R.
Rocha, John G., 4,043,249, Cl. 89-33.0CA.
Swift, Roderick D., 4,043,177, Cl. 73-15.00R.
Van Dyke, William A., Jr.; Baker, Frank S.; and McClintock, Robert, 4,043,687, Cl. 403-109.000.
Wiese, Harold Herman, 4,043,250, Cl. 89-170.000.

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Francis, Chester W.; and Brinkley, Frank S., 4,043,936, Cl. 252-301.10W.
Goodwin, William L., 4,043,671, Cl. 356-106.00R.
Isaacs, Hugh S.; and Romano, Anthony J., 4,043,890, Cl. 204-195.00S.
Shuck, Lowell Z., 4,043,192, Cl. 73-155.000.

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Eisele, Judith A.; Eichbaum, Barlane R.; and Bauer, Donald J., 4,044,115, Cl. 423-631.000.
Sanker, Philip E.; Oden, Laurance L.; and Russell, James H., 4,043,946, Cl. 252-466.00J.

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Donley, Shawn T.; and Freitag, Valentine A., 4,043,526, Cl. 244-194.000.
Hoffman, Richard E.; and Lindsay, Edward K., 4,043,850, Cl. 149-19.400.
Symanski, Jerome J.; and Keefer, Russell L., 4,044,271, Cl. 307-262.000.
Whitehead, Jan Valgene; Reininger, Frederick J.; and Lawrence, Arthur, 4,043,044, Cl. 33-172.00E.

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Clarisse, Eddy Johan, 4,043,207, Cl. 74-10.150.
Van Dijk, Jan; and Zwagemakers, Johannes Maria Antonius, 4,044,023, Cl. 260-326.470.

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Breault, Richard D.; Harding, Richard P.; and Kemp, Fred S., 4,043,933, Cl. 252-182.000.
Tedeschi, Rinaldo Robert, 4,043,189, Cl. 73-117.300.

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Korous, Donald J.; and Neuzil, Richard W., 4,044,062, Cl. 260-674.0SA.

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Villeret, Michel; Stephenne, Hubert; and Deschenes, Pierre A., 4,044,306, Cl. 325-38.00B.

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Cram, Donald J., 4,043,979, Cl. 260-47.0UP.
O'Brien, Michael, 4,043,443, Cl. 198-525.000.
Shuler, Kurt E.; and Schrauzer, Gerhard N., 4,043,934, Cl. 252-186.000.

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Yen, Teh Fu; and Wen, Chaur-Shyong, 4,043,881, Cl. 204-102.000.
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Budrose, Charles R., 4,044,393, Cl. 360-117.000.

Updegrave, Walter C., to Reading Techmatic Corporation. Rotator drive system. 4,043,210, Cl. 74-750.00R.

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Evans, Timothy W., 4,043,870, Cl. 195-66.00R.
Holm, James P.; and Dudley, Ronald J., 4,044,227, Cl. 235-61.70R.
Roseman, Theodore J., 4,043,339, Cl. 128-260.000.
Wright, John B.; and Hall, Charles M., 4,044,148, Cl. 424-317.000.

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Kilmurry, Lindsay; and Urion, Howard Kirby, 4,043,752, Cl. 8-41.00B.

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Meyer, Engelbert A., 4,043,579, Cl. 293-71.00R.

V. W. Kaiser Engineering, Inc.: *See—*
Kaiser, Virgil W., deceased, 4,043,567, Cl. 280-96.100.

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Riano, Marcos D., 4,043,717, Cl. 425-7.000.

Valleylab, Inc.: *See—*
Morrison, Charles F., Jr., 4,043,342, Cl. 128-303.140.

Van Dam, John F.; and Pacholok, Jaroslaw, to Bell & Howell Company. Label applying machine. 4,043,859, Cl. 156-566.000.

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Piepenhagen, John H.K.; and Vanecek, Michael J., 4,043,384, Cl. 164-282.000.

van Ham, Ernest E., to Sanders Associates, Inc. Cable cutter. 4,043,238, Cl. 83-595.000.

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Van Sickle, Roswell C., to Westinghouse Electric Corporation. Fluid-blast circuit interrupter. 4,044,210, Cl. 200-148.00H.

Van Thyne, Ray J.: *See—*
Rausch, John J.; and Van Thyne, Ray J., 4,043,623, Cl. 308-238.000.

Van Voorhis, David Curtis, to International Business Machines Corporation. Variable-length to fixed-length conversion of minimum-redundancy codes. 4,044,347, Cl. 340-347.0DD.

Vapor Corporation: *See—*
Fluder, Chester Henry; and Yohanna, Nick J., 4,043,143, Cl. 62-243.000.

Varian Associates, Inc.: *See—*
Helmer, John Colville, 4,043,906, Cl. 210-31.00C.

Varon, Hyman. Tool for removing animal hair from carpeting. 4,042,995, Cl. 15-142.000.

Vasile, Carmine F., to Rockwell International Corporation. Surface acoustic wave band pass filtering. 4,044,321, Cl. 333-72.000.

Vater, Wulf: *See—*
Bossert, Friedrich; Wehinger, Egbert; Stoepel, Kurt; Vater, Wulf; and Kazda, Stanislav, 4,044,141, Cl. 424-266.000.

Veater, Vallon C. Laboratory drying oven and method. 4,043,048, Cl. 34-4.000.

VEB Leuna-Werke "Walter Ulbricht": *See—*
Reif, Hans-Heinrich; Wehner, Klaus; Welker, Jurgen; Schmidt, Karl-Heinz; Schnick, Waltraud; Widmann, Lutz; Schicker, Otto; Seidel, Gunter; Kalb, Karsten; Dollase, Wolfhard; Furtig, Helmut; Hose, Werner; Roscher, Wolfgang; Hadicke, Udo; Knoll, Herbert; Seidel, Rudiger; Nemitz, Gunter; Sturmer, Edith; and Kaiser, Manfred, 4,043,938, Cl. 252-412.000.

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Veeneman, John L.: *See—*
Shatila, Mounir A.; Von Der Lieth, William H.; Veeneman, John L.; and Thomas, Marion E., 4,044,163, Cl. 426-502.000.

Velsicol Chemical Corporation: *See—*
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Vendo Company, The: *See—*
Gore, LeRoy D.; Gillett, William G.; and Roberts, George F., 4,043,483, Cl. 221-155.000.

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Krisch, Burkhard; Muller, Karl-Heinz; Rauch, Moriz von; and Veneklasen, Lee H., 4,044,256, Cl. 250-311.000.

Venezio, William R. Socket wrench. 4,043,228, Cl. 81-57.300.

Verbeek, Francois: *See—*
Bulten, Eric J.; and Verbeek, Francois, 4,044,035, Cl. 260-429.700.

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Vereinigte Delstahlwerke AG. (VEW): *See—*
Rajakovics, Gundolf E.; Gabernig, Heinz; and Klein, Guenter Peter, 4,043,875, Cl. 203-82.000.

Verkler, David C. Combination cart-checkstand. 4,043,426, Cl. 186-1.0AC.

Vetter, Earl E., to Boeing Company, The; and Aeritalia S.p.A. Common pod for housing a plurality of different turbofan jet propulsion engines. 4,043,522, Cl. 244-54.000.

Viapiano, Ugo; and Andreoni, Odoardo. Assembly of prefabricated

elements for forming walls of planar and/or non-planar configuration. 4,043,090, Cl. 52-583.000.

Vic-Tree (Mouldings) Limited: *See*—
Hyams, Joseph Edward, 4,043,685, Cl. 403-19.000.

Vice, Earl C., to Armco Steel Corporation. Dual track transfer system and a transfer car for use therewith. 4,043,466, Cl. 214-18.0SC.

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Sliski, Chester, 4,043,358, Cl. 137-512.100.

Victor B. Godin, Trustee: *See*—
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Villeret, Michel; Stephenne, Hubert; and Deschenes, Pierre A., to Universite de Snerbrooke. Digital converter from pulse code modulation to continuous variable slope delta modulation. 4,044,306, Cl. 325-38.00B.

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Renirie, Alexis C. M., 4,043,347, Cl. 128-419.0PG.

Vitti, Rudolf A.: *See*—
Jolly, Michael D.; Nacci, Anthony T.; DeCeglie, Gaetano J.; and Vitti, Rudolf A., 4,044,167, Cl. 426-594.000.

Vixie, Dennis E.: *See*—
Hollister, Geoffrey L.; and Vixie, Dennis E., 4,043,058, Cl. 36-102.000.

Vlahos, Petro, to Association of Motion Picture and Television Producers, Inc., The. Apparatus for reproducing a multiple track photographic sound record. 4,044,207, Cl. 179-100.30B.

Vock, Gunther, to Hoechst Aktiengesellschaft. Tire monofilaments. 4,043,985, Cl. 260-75.00T.

Vock, Manfred Hugo: *See*—
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von Bose, Robert J.: *See*—
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von Schmeling, Bogislav; and Boos, Walter R., to Uniroyal, Inc.; and Uniroyal Ltd. Bis(diphenylaminomethane) antimicrobial agents. 4,044,139, Cl. 424-263.000.

Vosbeek, Gerardus J.: *See*—
Bomers, Johannes P.; and Vosbeek, Gerardus J., 4,043,816, Cl. 96-49.000.

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Hari, Stefan; Irvine, Alexander McHugh; McCrae, James McGeachie; Vuitel, Laurent; and L'Eplattenier, Francois, 4,044,036, Cl. 260-438.100.

Vulovic, Radoje, to Sun Shipbuilding and Dry Dock Co. Ship loading ramp. 4,043,288, Cl. 114-270.000.

W. R. Grace & Co.: *See*—
Giraudi, Giorgio Aldo Maria; and Imperiale, Nino, 4,043,011, Cl. 29-33.500.
Kremkau, William P., 4,044,187, Cl. 428-212.000.
Wessells, Forrest A.; and Pickard, John E., 4,042,996, Cl. 15-306.00R.
Wright, John L., 4,043,246, Cl. 85-11.000.

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Hurst, John, 4,044,091, Cl. 264-251.000.

Wace, Peter Frederick, to United Kingdom Atomic Energy Authority. Apparatus for the formation of liquid droplets. 4,043,507, Cl. 239-102.000.

Wachtel, James Alan: *See*—
McChesney, Charles Edmund; McHenry, Robert J.; and Wachtel, James Alan, 4,044,086, Cl. 264-97.000.

Wacker-Chemie GmbH: *See*—
Adler, Klaus; Pichler, Engelbert; Kemenater, Christoph; Dressler, Wilfried; and Bauer, Johann, 4,043,962, Cl. 260-29.300.
Wiest, Hubert; Lieb, Erwin; and Schafer, Heinz, 4,044,197, Cl. 526-304.000.

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Jacob, Herbert; and Lampert, Ingolf, 4,043,861, Cl. 156-636.000.

Wacker-Dearborn Corporation: *See*—
Wecker, Walter A., Sr., 4,043,916, Cl. 210-238.000.

Wada, Hidetsugu; Asano, Yoichi; and Suzumura, Yoshikazu, to Hitachi, Ltd. Method of and apparatus for measuring information hold time of memory cell in dynamic MIS memory. 4,044,344, Cl. 340-173.0DR.

Wade, Arthur L.: *See*—
Ried, Louis, Jr.; and Wade, Arthur L., 4,044,263, Cl. 250-381.000.

Wade, Melvin J.: *See*—
Au Coin, Thomas R.; Schwartz, Abraham; Gualtieri, John G.; and Wade, Melvin J., 4,043,860, Cl. 156-624.000.

Wagar, Nelson William, to Hercules Incorporated. Ceramic color compositions and a method for decorating ceramic ware therewith. 4,043,824, Cl. 106-48.000.

Wagner, Earl William: *See*—
Bickford, David Edward; Southard, Robert Keith; Sucheski, Matthew Michael; and Wagner, Earl William, 4,043,494, Cl. 226-109.000.
Sucheski, Matthew Michael; and Wagner, Earl William, 4,043,034, Cl. 29-749.000.

Wagner, Kuno: *See*—
Muller, Hanns Peter; Wagner, Kuno; and Muller, Richard, 4,044,171, Cl. 427-27.000.

Wagner, Robert J.; and Atherton, Ralph R., to Allis-Chalmers Corporation. Vehicle suspension and stabilizer system. 4,043,584, Cl. 296-35.00R.

Wagstaff, Paul Arlen, to Ortho Pharmaceutical Corporation. Method for detection of human mammary carcinoma. 4,043,757, Cl. 23-230.00B.

Wald Manufacturing Company, Inc.: *See*—
Humlong, Robert F., 4,043,688, Cl. 403-209.000.

Waldbillig, James O.: *See*—
Wiley, Morris A.; Schlicht, Raymond C.; and Waldbillig, James O., 4,044,032, Cl. 260-399.000.

Walden, Craig C.: *See*—
Birkbeck, Alexander E.; and Walden, Craig C., 4,043,299, Cl. 119-3.000.

Waldman Corporation: *See*—
Bryceland, Maurice Cyril, 4,043,115, Cl. 58-50.00R.

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Phillips, Kenneth G.; Walford, Richard P.; and Knight, Clifford, 4,043,550, Cl. 271-233.000.

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Yamazaki, Yoshio: *See*—
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Yanagida, Kiyomi; Hirokane, Tadashi; Tsukiyasu, Tadashi; and Sato, Tomoari, to Sumitomo Aluminum Smelting Co., Ltd. Method for producing green-colored anodic oxide film on aluminum or aluminum base alloy articles. 4,043,880, Cl. 204-35.00N.
Yanus, John F.: *See*—
Stolka, Milan; Pearson, James M.; and Yanus, John F., 4,043,812, Cl. 96-1.500.
Yao, Szee Ming, to Abbott Coin Counter Co., Inc. System for interfacing keyboard-operated apparatus with electrical data signals. 4,044,398, Cl. 364-900.000.
Yaron, Baruch, to Incontrol Ltd. Pressure reducing device for fluids. 4,043,360, Cl. 138-42.000.
Yasui, Takashi: *See*—
Sakamoto, Eiichi; Kubo, Masanobu; Yasui, Takashi; Suzuki, Katsuya; and Tachibana, Katsuhiko, 4,043,801, Cl. 75-60.000.
Yeakey, Ernest L.: *See*—
Brennan, Michael E.; Moss, Philip H.; and Yeakey, Ernest L., 4,044,053, Cl. 260-583.00P.

Yeda Research & Development Co., Ltd.: *See—*
Schmidt, Gerhard Martin Julius, deceased; Dror, Michael; Friedman, Gad; and Levine, Harold H., 4,043,978, Cl. 260-47.0CP.
Yegge, Lawrence R. Structure and method of constructing and test-loading pile anchored foundations. 4,043,133, Cl. 61-50.000.
Yen, Teh Fu; and Wen, Chaur-Shyong, to University of Southern California. Electrolytic recovery of economic values from shale oil retort water. 4,043,881, Cl. 204-102.000.
Yen, Teh Fu; and Wen, Chaur-Shyong, to University of Southern California. Electrolytic hydrogenation of leached oil shale components. 4,043,884, Cl. 204-131.000.
Yen, Teh Fu; Wen, Chaur-Shyong; and Kwan, Jonathan, to University of Southern California. Electrolytic pyrite removal from kerogen materials. 4,043,885, Cl. 204-131.000.
Yeo, Herbert G., to Augat Inc. Machine for inserting electrical contacts into electrical interconnection boards. 4,043,033, Cl. 29-739.000.
Yip, James Kwok-fun: *See—*
Larson, Bernard J.; Johnson, Oliver Wendell; and Yip, James Kwok-fun, 4,043,419, Cl. 180-132.000.
Yohanna, Nick J.: *See—*
Fluder, Chester Henry; and Yohanna, Nick J., 4,043,143, Cl. 62-243.000.
Yokoi, Hiroshi; and Akagawa, Masataka, to Kokusai Denshin Denwa Kabushiki Kaisha. Satellite tracking cassegrainian antenna. 4,044,361, Cl. 343-754.000.
Yonkers, Robert A.: *See—*
McDowell, David E.; and Yonkers, Robert A., 4,042,997, Cl. 15-366.000.
York Engineering, Inc.: *See—*
Browne, William R. K., 4,043,690, Cl. 403-268.000.
York, George. Automatic screw driver having brake responsive ball clutch means. 4,043,365, Cl. 144-32.00R.
Yoshida, Makoto: *See—*
Koike, Yoshiyasu; Shiraki, Hachio; Suzuki, Eigen; and Yoshida, Makoto, 4,043,028, Cl. 29-599.000.
Yoshikawa, Toshio; Sakamoto, Nagayoshi; Kurita, Masayuki; Oh-e, Shunji; and Nagamori, Lomitado, to UBE Industries, Ltd. Stabilized olefin polymer composition. 4,043,976, Cl. 260-45.80N.
Yoshimoto, Toshio: *See—*
Miyoshi, Isao; Abe, Masaru; Tezuka, Toshiro; and Yoshimoto, Toshio, 4,043,372, Cl. 152-354.000.
Yoshino, Masaki: *See—*
Seki, Masao; Kito, Hidetoshi; and Yoshino, Masaki, 4,043,233, Cl. 83-23.000.
Zahner, John C.: *See—*
Chang, Clarence D.; Silvestri, Anthony J.; and Zahner, John C., 4,044,061, Cl. 260-668.00R.
Zahner, Marvin L. Fish hook setting device. 4,043,069, Cl. 43-15.000.
Zahnradfabrik Friedrichshafen Aktiengesellschaft: *See—*
Mosbacher, Rudolf; and Ruppik, Hans, 4,043,021, Cl. 29-437.000.
Zajac, Edward: *See—*
McCabe, Barkman C.; and Zajac, Edward, 4,043,129, Cl. 60-641.000.
Zebuhr, William Henry, to Deschamps Laboratories, Inc. Thermal transfer care. 4,043,388, Cl. 165-166.000.
Zegel, Snyder M. Teaching aid for accounting. 4,043,055, Cl. 35-24.00R.
Zelenski, Paul Allen: *See—*
Isenberg, Don Eugene; Parker, Irvin Lee, Jr.; and Zelenski, Paul Allen, 4,043,383, Cl. 164-274.000.
Zenda, Richard J.: *See—*
Malacheski, Joseph J.; and Zenda, Richard J., 4,043,159, Cl. 70-38.00R.
Zenith Radio Corporation: *See—*
Laub, Leonard J., 4,044,378, Cl. 358-128.000.
Zens, Rene Joseph Louis; and Horsman, William W., to Horsman, William W. High frequency gas detonator. 4,043,420, Cl. 181-117.000.
Zentner, Erich: *See—*
Kratzmann, Helmut; Heinik, Josef; Obermaier, Robert; Zentner, Erich; and Redinger, Robert, 4,043,731, Cl. 425-366.000.
Zeppernick, Friedrich; and Dotzel, Klaus-Peter, to Felix Bottcher, Firma. Transfer roller. 4,043,013, Cl. 29-132.000.
Ziegler, John S.: *See—*
Cawood, Charles D., Jr.; and Ziegler, John S., 4,043,328, Cl. 128-132.00D.
Zimmer, Aaron. Bearing cartridge assembly. 4,043,616, Cl. 308-36.300.
Zimmern, Bernard, to Uniscrew Limited. Double-acting rotary expansible chamber pump adaptable to series or parallel operation. 4,043,704, Cl. 417-62.000.
Zitko, Ronald F.; and Adams, James R., to International Harvester Company. Louver linkage seal. 4,043,258, Cl. 98-121.00A.
Zupanick, Joseph E., to Sun Oil Company Limited. Method and apparatus for preventing fluid solidification in an aperture. 4,043,132, Cl. 61-1.00R.
Zupanick, Joseph E.: *See—*
Macy, Robert L.; and Zupanick, Joseph E., 4,042,991, Cl. 14-1.000.
Zurla, Frank Anthony, Jr.: *See—*
Hicks, Glen LeRoy; Howe, Leland Delmar, Jr.; and Zurla, Frank Anthony, Jr., 4,044,337, Cl. 364-200.000.
Zwagemakers, Johannes Maria Antonius: *See—*
Van Dijk, Jan; and Zwagemakers, Johannes Maria Antonius, 4,044,023, Cl. 260-326.470.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF AUGUST, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Allied Chemical Corporation: *See*—
Pez, Guido P., Re. 29,368, Cl. 260-429.300.

Anderson Bros. Mfg. Co.: *See*—
Reid, Laurie M., Re. 29,362, Cl. 53-198.00R.

Benefiel, Robert Lee; and Krumkalns, Eriks Viktors, to Eli Lilly and Company. Fluoroalkoxyphenyl-substituted nitrogen heterocycles as plant stunting agents. Re. 29,367, Cl. 71-76.000.

Butler Automatic, Inc.: *See*—
Butler Jr., Richard A., Re. 29,365, Cl. 242-58.300.

Butler Jr., Richard A., to Butler Automatic, Inc. Web supply apparatus. Re. 29,365, Cl. 242-58.300.

DeBortoli, George; and Lukas, Helmut Hans, to Northern Electric Company Limited. Connecting block. Re. 29,371, Cl. 174-60.000.

Du Pont de Nemours, E. I., and Company: *See*—
McKay, Jerry Bruce, Re. 29,363, Cl. 57-140.00J.

Eli Lilly and Company: *See*—
Benefiel, Robert Lee; and Krumkalns, Eriks Viktors, Re. 29,367, Cl. 71-76.000.

Fujimoto, Yasuo; and Nakamizo, Nobuhiro, to Kyowa Hakko Kogyo Co., Ltd. Method for preparing acylated products. Re. 29,369, Cl. 260-471.00C.

Giannotti, Hugo V., to Ski Dynamics, Inc. Ski anti-crossing device. Re. 29,366, Cl. 280-11.37E.

Imperial Chemical Industries Limited: *See*—
Sandiford, Denis James Henry; and Kail, John Alan Elliott, Re. 29,370, Cl. 264-22.000.

Kail, John Alan Elliott: *See*—
Sandiford, Denis James Henry; and Kail, John Alan Elliott, Re. 29,370, Cl. 264-22.000.

Krumkalns, Eriks Viktors: *See*—
Benefiel, Robert Lee; and Krumkalns, Eriks Viktors, Re. 29,367, Cl. 71-76.000.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Fujimoto, Yasuo; and Nakamizo, Nobuhiro, Re. 29,369, Cl. 260-471.00C.

Lukas, Helmut Hans: *See*—
DeBortoli, George; and Lukas, Helmut Hans, Re. 29,371, Cl. 174-60.000.

McKay, Jerry Bruce, to Du Pont de Nemours, E. I., and Company. False-twist texturing yarn of polyester filaments having multilobal cross sections. Re. 29,363, Cl. 57-140.00J.

Nakamizo, Nobuhiro: *See*—
Fujimoto, Yasuo; and Nakamizo, Nobuhiro, Re. 29,369, Cl. 260-471.00C.

Northern Electric Company Limited: *See*—
DeBortoli, George; and Lukas, Helmut Hans, Re. 29,371, Cl. 174-60.000.

Pez, Guido P., to Allied Chemical Corporation. Metal-organo compounds with sterically exposed metal-metal bonds, and a method for their production. Re. 29,368, Cl. 260-429.300.

Reid, Laurie M., to Anderson Bros. Mfg. Co. Packaging apparatus. Re. 29,362, Cl. 53-198.00R.

Robley, Spencer H., deceased, to Underwater Devices, Inc. Method of submarine pipe laying. Re. 29,364, Cl. 61-111.000.

Sandiford, Denis James Henry; and Kail, John Alan Elliott, to Imperial Chemical Industries Limited. Thermoplastic film production. Re. 29,370, Cl. 264-22.000.

Ski Dynamics, Inc.: *See*—
Giannotti, Hugo V., Re. 29,366, Cl. 280-11.37E.

Underwater Devices, Inc.: *See*—
Robley, Spencer H., deceased, Re. 29,364, Cl. 61-111.000.

LIST OF PLANT PATENTEES

Anderson, Frederic W., to Burchell Nursery, Inc., The. Nectarine tree. 4,093, 8-23-77, Cl. 41.000.

Burchell Nursery, Inc., The: *See*—
Anderson, Frederic W., 4,093, Cl. 41.000.

Doyle, Thomas E. Doyle's Blackberry. 4,094, 8-23-77, Cl. 46.000.

LIST OF DESIGN PATENTEES

Adams, Joseph W.: *See*—
Herman, Albert W.; and Adams, Joseph W., 245,510, Cl. D23-113.000.

Adams, Stanley B.; Parks, John M.; and Reisel, James M., to Caterpillar Tractor Co. Tractor loader vehicle. 245,503, 8-23-77, Cl. D15-25.000.

Aktiebolaget Atomenergi: *See*—
Flinta, Jan; and Hernborg, Gunnar, 245,482, Cl. D10-96.000.

Alvimar Manufacturing Co., Inc.: *See*—
Friedlander, Alan P., 245,524, Cl. D34-5.00F.

Andreas, John C., to Gould Inc. Housing for electric motor. 245,498, 8-23-77, Cl. D13-1.000.

Andreas, John C., to Gould Inc. Housing for electric motor. 245,499, 8-23-77, Cl. D13-01.000.

Arbrook, Inc.: *See*—
Lindsey, Joseph W., 245,539, Cl. D24-62.000.
Lindsey, Joseph W., 245,540, Cl. D24-62.000.

Asaro, Salvatore M. Love seat. 245,466, 8-23-77, Cl. D6-74.000.

B & J Rocket (Hong Kong) Limited: *See*—
Jensen, Wayne E., 245,472, Cl. D7-149.000.

Behling, Fredric C.; and Sullivan, Paul J. Toy figure. 245,523, 8-23-77, Cl. D34-4.00R.

Bettcher Manufacturing Corporation: *See*—
Herman, Albert W.; and Adams, Joseph W., 245,510, Cl. D23-113.000.

Bidwell, Robert: *See*—
Kurtz, Leonard David; and Bidwell, Robert, 245,538, Cl. D24-34.000.

Booth, Clyde C. Burial facility. 245,519, 8-23-77, Cl. D25-33.000.

Bourgeois, Ronald D. Ski vise. 245,475, 8-23-77, Cl. D8-72.000.

Brush, John B., to Procter & Gamble Company, The. Folding display basket for cartoned products. 245,480, 8-23-77, Cl. D9-248.000.

Bullock, Maynard J. Educational toy clock. 245,505, 8-23-77, Cl. D19-64.000.

Cammarota, David Francis. Golf tee sharpener. 245,476, 8-23-77, Cl. D8-91.000.

Caterpillar Tractor Co.: *See*—
Adams, Stanley B.; Parks, John M.; and Reisel, James M., 245,503, Cl. D15-25.000.

Chou, Chen Ching. Protective face mask. 245,545, 8-23-77, Cl. D29-8.000.

Clare, Michael A., to Windcraft Corporation. Air cushioned vehicle. 245,492, 8-23-77, Cl. D12-5.000.

Clough, Christopher John; and Jackson, Eric. Collapsible display carton. 245,478, 8-23-77, Cl. D9-224.000.

Concept, Inc.: *See*—
Troutner, Vernon H.; and Simmons, Raymond W., 245,515, Cl. D24-29.000.

Copeland, Alvin C. Restaurant building. 245,518, 8-23-77, Cl. D25-25.000.

Crow, Lawrence E. Bathtub spout. 245,507, 8-23-77, Cl. D23-32.000.

Crow, Lawrence E. Shower spout. 245,508, 8-23-77, Cl. D23-32.000.

DeBurgh, Raymond J. Portable urinal. 245,543, 8-23-77, Cl. D24-54.000.

Defores, Eugene, to Waterman. Pen. 245,504, 8-23-77, Cl. D19-50.000.

Deknatel, Inc.: *See—*
Kurtz, Leonard David; and Bidwell, Robert, 245,538, Cl. D24-34.000.
Dyna Med, Inc.: *See—*
Kohl, William A., 245,512, Cl. D24-10.000.
Ehrlin, Hans T. A.: *See—*
Oscarsson, Jerker E.; Ehrlin, Hans T. A.; and Haggstam, Christian G., 245,502, Cl. D15-17.000.
Ernest, Robert O., to Sunbeam Corporation. Toaster oven. 245,470, 8-23-77, Cl. D7-91.000.
Falcon Safety Products, Inc.: *See—*
Pappas, Michael; Witte, Paul A.; and Johnson, Thomas, 245,488, Cl. D10-106.000.
Ferguson, Edward M., to Kusan, Inc. Combined toy vehicle and figure therefor. 245,530, 8-23-77, Cl. D34-15.0AN.
Fitch, James B., to General Signal Corporation. Liquid ring pump. 245,501, 8-23-77, Cl. D15-7.000.
Flinta, Jan; and Hernborg, Gunnar, to Aktiebolaget Atomenergi. Pitot tube fitting. 245,482, 8-23-77, Cl. D10-96.000.
Frassanito, John R. Liquid dispenser. 245,467, 8-23-77, Cl. D6-95.000.
Friedlander, Alan P., to Alvimar Manufacturing Co., Inc. Folding swimming pool. 245,524, 8-23-77, Cl. D34-5.00F.
Fukushima, Hisao; Watanabe, Katsuhito; Kanda, Yoshinori; and Watanabe, Tsutomu, to Oki Electric Industry Co., Ltd. Telephone set. 245,500, 8-23-77, Cl. D14-57.000.
Gary, Jerome A., to Taco Charley, Inc. Mexican food restaurant structure. 245,517, 8-23-77, Cl. D25-22.000.
General Signal Corporation: *See—*
Fitch, James B., 245,501, Cl. D15-7.000.
Gould Inc.: *See—*
Andreas, John C., 245,498, Cl. D13-1.000.
Andreas, John C., 245,499, Cl. D13-01.000.
Gulf & Western Manufacturing Company (Systems): *See—*
Kenig, Howard, 245,493, Cl. D12-55.000.
Gurgiolo, Donald Joseph. Human back support harness. 245,537, 8-23-77, Cl. D24-64.000.
Haggstam, Christian G.: *See—*
Oscarsson, Jerker E.; Ehrlin, Hans T. A.; and Haggstam, Christian G., 245,502, Cl. D15-17.000.
Hasbro Development Corporation: *See—*
Hudson, Robert H.; and Ptaszek, George W., 245,529, Cl. D34-15.0JJ.
Hatcher, Robert E.: *See—*
Mulkey, Dennis A.; and Hatcher, Robert E., 245,522, Cl. D30-43.000.
Hauf, Karl Peter Gunter; and Hofmeister, Werner Karl, to U.S. Philips Corporation. Cleaning brush for dry shaver. 245,462, 8-23-77, Cl. D4-10.000.
Henderson, Thomas J. Trailer. 245,495, 8-23-77, Cl. D12-101.000.
Heninger, Francine F. Mop head. 245,473, 8-23-77, Cl. D7-178.000.
Herman, Albert W.; and Adams, Joseph W., to Bettcher Manufacturing Corporation. Electric radiant space heater. 245,510, 8-23-77, Cl. D23-113.000.
Hernborg, Gunnar: *See—*
Flinta, Jan; and Hernborg, Gunnar, 245,482, Cl. D10-96.000.
Hindle, Wayne E. Combined table and seating unit. 245,465, 8-23-77, Cl. D6-45.000.
Hofmeister, Werner Karl: *See—*
Hauf, Karl Peter Gunter; and Hofmeister, Werner Karl, 245,462, Cl. D4-10.000.
Horwitz, Norton Jay, to Silver Manufacturing, Inc. Table. 245,468, 8-23-77, Cl. D6-175.000.
Hudson, Robert H.; and Ptaszek, George W., to Hasbro Development Corporation. Toy submarine. 245,529, 8-23-77, Cl. D34-15.0JJ.
Hydro-Spa, Inc.: *See—*
Melchior, Merle C., 245,541, Cl. D24-38.000.
Melcior, Merle C., 245,542, Cl. D24-38.000.
Jackson, Eric: *See—*
Clough, Christopher John; and Jackson, Eric, 245,478, Cl. D9-224.000.
Jensen, Wayne E., to B & J Rocket (Hong Kong) Limited. Combined knife and chopstick. 245,472, 8-23-77, Cl. D7-149.000.
Johnson, Thomas: *See—*
Pappas, Michael; Witte, Paul A.; and Johnson, Thomas, 245,488, Cl. D10-106.000.
Jones, Jack, Jr., to Jones, Sr., Jack. Shoulder wallet. 245,461, 8-23-77, Cl. D2-383.000.
Jones, Sr., Jack: *See—*
Jones, Jack, Jr., 245,461, Cl. D2-383.000.
Kanda, Yoshinori: *See—*
Fukushima, Hisao; Watanabe, Katsuhito; Kanda, Yoshinori; and Watanabe, Tsutomu, 245,500, Cl. D14-57.000.
Kenig, Howard, to Gulf & Western Manufacturing Company (Systems). Floor jack. 245,493, 8-23-77, Cl. D12-55.000.
Kikoler, Ted G. Electronic insect lamp. 245,506, 8-23-77, Cl. D22-19.000.
Klitzner, William S. Zodiac charm. 245,490, 8-23-77, Cl. D11-81.000.
Kohl, William A., to Dyna Med, Inc. Ventilated bite stick. 245,512, 8-23-77, Cl. D24-10.000.
Kopel, Leroy A., to Krautkramer-Branson, Incorporated. Ultrasonic transducer probe. 245,513, 8-23-77, Cl. D24-17.000.
Koster, Neil A. Portable animal enclosure. 245,521, 8-23-77, Cl. D30-1.000.
Krautkramer-Branson, Incorporated: *See—*
Kopel, Leroy A., 245,513, Cl. D24-17.000.
Pennebaker, Bradley, 245,514, Cl. D24-17.000.
Kurtz, Leonard David; and Bidwell, Robert, to Deknatel, Inc. Stand for a drainage device. 245,538, 8-23-77, Cl. D24-34.000.
Kusan, Inc.: *See—*
Ferguson, Edward M., 245,530, Cl. D34-15.0AN.
Lewis, Nolan. Combined furniture commode and room fan. 245,511, 8-23-77, Cl. D23-155.000.
Lindsey, Joseph W., to Arbrook, Inc. Nebulizer-humidifier bag assembly. 245,539, 8-23-77, Cl. D24-62.000.
Lindsey, Joseph W., to Arbrook, Inc. Nebulizer bag. 245,540, 8-23-77, Cl. D24-62.000.
MacInnis, J. Thomas: *See—*
MacInnis, John W.; and MacInnis, J. Thomas, 245,471, Cl. D7-104.000.
MacInnis, John W.; and MacInnis, J. Thomas. Scoop. 245,471, 8-23-77, Cl. D7-104.000.
Malcolm, Donald A., to W. R. Grace & Co. Display case. 245,479, 8-23-77, Cl. D9-224.000.
Melchior, Merle C., to Hydro-Spa, Inc. Bathing pool. 245,541, 8-23-77, Cl. D24-38.000.
Melcior, Merle C., to Hydro-Spa, Inc. Bathing pool. 245,542, 8-23-77, Cl. D24-38.000.
Milner, Carol D. Butterfly puzzle. 245,528, 8-23-77, Cl. D34-15.00M.
Mulkey, Dennis A.; and Hatcher, Robert E. Insect repellant and disinfectant pendant for domestic animals. 245,522, 8-23-77, Cl. D30-43.000.
Mullenax, Earnest R. Ground anchor tie-down for securing objects such as mobile homes and the like. 245,477, 8-23-77, Cl. D8-382.000.
Niskin, Shale J. Shielded flow meter. 245,483, 8-23-77, Cl. D10-96.000.
Niskin, Shale J. Three bladed cylindrical flow meter. 245,484, 8-23-77, Cl. D10-96.000.
Niskin, Shale J. Bayed flow meter. 245,485, 8-23-77, Cl. D10-96.000.
Niskin, Shale J. Three bladed bayed flow meter. 245,486, 8-23-77, Cl. D10-96.000.
Niskin, Shale J. Cylindrical flow meter. 245,487, 8-23-77, Cl. D10-96.000.
Nordson Corporation: *See—*
Scholl, Charles H., 245,474, Cl. D8-30.000.
Oki Electric Industry Co., Ltd.: *See—*
Fukushima, Hisao; Watanabe, Katsuhito; Kanda, Yoshinori; and Watanabe, Tsutomu, 245,500, Cl. D14-57.000.
Oscarsson, Jerker E.; Ehrlin, Hans T. A.; and Haggstam, Christian G., to Stiga AB. Lawn mower body. 245,502, 8-23-77, Cl. D15-17.000.
Pappas, Michael; Witte, Paul A.; and Johnson, Thomas, to Falcon Safety Products, Inc. Fire alarm. 245,488, 8-23-77, Cl. D10-106.000.
Parks, John M.: *See—*
Adams, Stanley B.; Parks, John M.; and Reisel, James M., 245,503, Cl. D15-25.000.
Pennebaker, Bradley, to Krautkramer-Branson, Incorporated. Ultrasonic transducer probe. 245,514, 8-23-77, Cl. D24-17.000.
Petrucci, Robert A.: *See—*
Ronci, Anthony; and Petrucci, Robert A., 245,481, Cl. D10-64.000.
Pittman, Cleother. Combined comb and brush. 245,544, 8-23-77, Cl. D28-25.000.
Procter & Gamble Company, The: *See—*
Brush, John B., 245,480, Cl. D9-248.000.
Ptaszek, George W.: *See—*
Hudson, Robert H.; and Ptaszek, George W., 245,529, Cl. D34-15.0JJ.
Reisel, James M.: *See—*
Adams, Stanley B.; Parks, John M.; and Reisel, James M., 245,503, Cl. D15-25.000.
Reiss, Meyer M. Protective shield for use with radioactive materials. 245,464, 8-23-77, Cl. D6-27.000.
Richards Manufacturing Company, Inc.: *See—*
Treace, James T., 245,516, Cl. D24-33.000.
Rimberg, Harry. Star ring or similar article. 245,489, 8-23-77, Cl. D11-26.000.
Ritch, Donald W. License plate holder. 245,497, 8-23-77, Cl. D12-193.000.
Ronci, Anthony; and Petrucci, Robert A. Quahog sizing ring. 245,481, 8-23-77, Cl. D10-64.000.
Sauter, Kenneth W. Game cabinet. 245,526, 8-23-77, Cl. D34-5.00L.
Sauter, Kenneth W. Game cabinet. 245,527, 8-23-77, Cl. D34-5.00L.
Scholl, Charles H., to Nordson Corporation. Adhesive dispenser. 245,474, 8-23-77, Cl. D8-30.000.
Seal, Michael R.: *See—*
Selvidge, Craig A.; and Seal, Michael R., 245,494, Cl. D12-90.000.
Segil, Arthur W. Lighting baffle. 245,533, 8-23-77, Cl. D48-16.00A.
Segil, Arthur W. Lighting baffle. 245,534, 8-23-77, Cl. D48-16.00A.
Segil, Arthur W. Lighting baffle. 245,535, 8-23-77, Cl. D48-16.00A.
Segil, Arthur W. Lighting baffle. 245,536, 8-23-77, Cl. D48-16.00A.
Selvidge, Craig A.; and Seal, Michael R., to Western Washington State College. Automotive vehicle. 245,494, 8-23-77, Cl. D12-90.000.
Shiraishi, Masami, to Tomy Kogyo Co., Inc. Toy bird. 245,531, 8-23-77, Cl. D34-15.00C.
Siegel, Owen. Plaque or the like. 245,491, 8-23-77, Cl. D11-139.000.
Silver Manufacturing, Inc.: *See—*
Horwitz, Norton Jay, 245,468, Cl. D6-175.000.
Simmons, Raymond W.: *See—*
Troutner, Vernon H.; and Simmons, Raymond W., 245,515, Cl. D24-29.000.
Smedley, Stephen L. Combined coffee table and planter. 245,463, 8-23-77, Cl. D6-4.000.
Smilko, Paul. Planter. 245,469, 8-23-77, Cl. D6-182.000.
Smith, Albert H.; and Smith, Randall S. Telephone locking device. 245,520, 8-23-77, Cl. D14-59.000.

Smith, Randall S.: *See*—
Smith, Albert H.; and Smith, Randall S., 245,520, Cl. D14-59.000.
Stiga AB: *See*—
Oscarsson, Jerker E.; Ehrlin, Hans T. A.; and Haggstam, Christian G., 245,502, Cl. D15-17.000.
Stoltzfus, David K.: *See*—
Ulmer, Robert G.; and Stoltzfus, David K., 245,509, Cl. D23-92.000.
Sullivan, Paul J.: *See*—
Behling, Fredric C.; and Sullivan, Paul J., 245,523, Cl. D34-4.00R.
Sunbeam Corporation: *See*—
Ernest, Robert O., 245,470, Cl. D7-91.000.
Taco Charley, Inc.: *See*—
Gary, Jerome A., 245,517, Cl. D25-22.000.
Taylor, Donald. Swim vest with dorsal fin. 245,532, 8-23-77, Cl. D34-43.000.
Tomy Kogyo Co., Inc.: *See*—
Shiraishi, Masami, 245,531, Cl. D34-15.00C.
Treace, James T., to Richards Manufacturing Company, Inc. Artificial cruciate ligament. 245,516, 8-23-77, Cl. D24-33.000.
Troutner, Vernon H.; and Simmons, Raymond W., to Concept, Inc. Light for vaginal speculum. 245,515, 8-23-77, Cl. D24-29.000.
Ulmer, Robert G.; and Stoltzfus, David K., to said Robert G. Ulmer; by said David K. Stoltzfus. Wood burning furnace. 245,509, 8-23-77, Cl. D23-92.000.
U.S. Philips Corporation: *See*—
Hauf, Karl Peter Gunter; and Hofmeister, Werner Karl, 245,462, Cl. D4-10.000.
W. R. Grace & Co.: *See*—
Malcolm, Donald A., 245,479, Cl. D9-224.000.
Watanabe, Katsuhito: *See*—
Fukushima, Hisao; Watanabe, Katsuhito; Kanda, Yoshinori; and Watanabe, Tsutomu, 245,500, Cl. D14-57.000.
Watanabe, Tsutomu: *See*—
Fukushima, Hisao; Watanabe, Katsuhito; Kanda, Yoshinori; and Watanabe, Tsutomu, 245,500, Cl. D14-57.000.
Waterman: *See*—
Defores, Eugene, 245,504, Cl. D19-50.000.
Wayne, Ronald G. Game cabinet. 245,525, 8-23-77, Cl. D34-5.00L.
Western Washington State College: *See*—
Selvidge, Craig A.; and Seal, Michael R., 245,494, Cl. D12-90.000.
Wheeler, John Francis. Vehicle roll bar unit. 245,496, 8-23-77, Cl. D12-156.000.
Windcraft Corporation: *See*—
Clare, Michael A., 245,492, Cl. D12-5.000.
Witte, Paul A.: *See*—
Pappas, Michael; Witte, Paul A.; and Johnson, Thomas, 245,488, Cl. D10-106.000.

CLASSIFICATION OF PATENTS

ISSUED AUGUST 23, 1977

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

9	4,042,974
19	4,042,975
135	4,042,976
161 A	4,042,977

CLASS 3

1	4,042,978
1.5	4,042,979
1.91	4,042,980

CLASS 4

10	4,042,981
67 A	4,042,982
200	4,042,984
291	4,042,983

CLASS 5

317 R	4,042,985
335	4,042,986
345 R	4,042,987
349	4,042,988

CLASS 8

1 XB	4,043,749
10.2	4,043,750
41 B	4,043,752
41 C	4,043,751
115.5	4,043,753
149	4,042,989

CLASS 9

8 P	4,042,990

CLASS 13

18	4,044,199

CLASS 14

1	4,042,991
69.5	4,042,992

CLASS 15

21 D	4,042,993
83	4,042,994
142	4,042,995
306 R	4,042,996
312 A	4,042,998
366	4,042,997
422	4,042,999

CLASS 16

128 R	4,043,000
189	4,043,001

CLASS 17

32	4,043,002
67	4,043,003

CLASS 19

155	4,043,005
200	4,043,004

CLASS 21

82 R	4,043,754

CLASS 23

230 B	4,043,757
230 R	4,043,755
	4,043,756
230.6	4,043,759
262	4,043,758
270 R	4,043,760
288 FC	4,043,761
292	4,043,762

CLASS 24

90 R	4,043,006
205.1 C	4,043,007

CLASS 28

220	4,043,010
221	4,043,009
271	4,043,008

CLASS 29

33.5	4,043,011
105 R	4,043,012
132	4,043,013
157.4	4,043,014
	4,043,015
240	4,043,016
427	4,043,018
	4,043,019
	4,043,020
437	4,043,021
460	4,043,022
527.6	4,043,023
571	4,043,024
	4,043,025
588	4,043,027
592	4,043,026
599	4,043,028
600	4,043,029
622	4,043,030
628	4,043,031
	4,043,032
739	4,043,033
749	4,043,017
	4,043,034

CLASS 30

40.2	4,043,035
43.6	4,043,036
276	4,043,037
293	4,043,038
325	4,043,039

CLASS 32

11	4,043,040
22	4,043,041
40 R	4,043,042

CLASS 33

137 L	4,043,043
172 E	4,043,044
174 S	4,043,045
185 R	4,043,046

CLASS 34

1	4,043,047
4	4,043,048
10	4,043,049
48	4,043,050
77	4,043,051
122	4,043,052

CLASS 35

8 R	4,043,053
9 A	4,043,054
24 R	4,043,055
28	4,043,056
74	4,043,057

CLASS 36

102	4,043,058
121	4,043,059

CLASS 37

141 R	4,043,060
	4,043,061

CLASS 38

102.91	4,043,270
140	4,043,062

CLASS 40

119	4,043,063
343	4,043,064

CLASS 42

1 R	4,043,065
71 P	4,043,066

CLASS 43

6	4,043,067
9	4,043,068
15	4,043,069
17.2	4,043,072
18 GF	4,043,074
21.2	4,043,070
23	4,043,071
124	4,043,073

CLASS 44

1 R	4,043,763
10 A	4,043,764
14	4,043,765

CLASS 46

202	4,043,075
228	4,043,076

CLASS 47

66	4,043,077

CLASS 48

73	4,043,766

CLASS 49

220	4,043,078
394	4,043,079

CLASS 51

33 W	4,043,080
103 WH	4,043,767
129	4,043,081
135 R	4,043,082
170 EB	4,043,083
318	4,043,084

CLASS 52

3	4,043,085
71	4,043,086
127	4,043,087
169.9	4,043,088
516	4,043,089
583	4,043,090
616	4,043,091
712	4,043,092
749	4,043,093

CLASS 53

3	4,043,094
26	4,043,095
41	4,043,096
52	4,043,097
180 M	4,043,098
198 R	Re.29,362

CLASS 55

5	4,043,768
25	4,043,769
62	4,043,770
93 BN	4,043,771
220	4,043,772
228	4,043,773
269	4,043,774
302	4,043,775
385 G	4,043,776

CLASS 56

10.9	4,043,099
16.5	4,043,100
17.1	4,043,101
17.4	4,043,102
295	4,043,103
	4,043,104
328 R	4,043,105

CLASS 57

34 R	4,043,106
	4,043,107
140 J	Re.29,363
157 R	4,043,108

CLASS 58

23 BA	4,043,110
	4,043,112
	4,043,113
23 R	4,043,109
	4,043,111
	4,043,114
50 R	4,043,115
88 R	4,043,116
142	4,043,117
152 R	4,043,118

CLASS 60

39.14	4,043,119
	4,043,120
204	4,043,121
375	4,043,122
397	4,043,123
404	4,043,124
406	4,043,125
407	4,043,126
453	4,043,127
636	4,043,128
641	4,043,129
655	4,043,130

CLASS 61

1 F	4,043,131
1 R	4,043,132
50	4,043,133
69 R	4,043,134
72.5	4,043,135
72.7	4,043,136
85	4,043,137
88	4,043,138
105	4,043,139
111	Re.29,364

CLASS 62

66	4,043,140
91	4,043,141
243	4,043,143
259	4,043,777
277	4,043,144

CLASS 63

15	4,043,145

CLASS 64

1 V	4,043,146
	4,043,147
17 R	4,043,148
30 C	4,043,149
32 R	4,043,150

CLASS 65

1	4,043,778
2	4,043,779
29	4,043,780
30 R	4,043,781
104	4,043,782
106	4,043,783
107	4,043,784
	4,043,785
114	4,043,786
227	4,043,787

CLASS 66

9 R	4,043,151
	4,043,152
120	4,043,153
125 R	4,043,154
132 T	4,043,155
170	4,043,142
177	4,043,156

CLASS 68

5 E	4,043,157
17 R	4,043,158

CLASS 70

38 R	4,043,159

CLASS 71

29	4,043,788
34	4,043,789
66	4,043,790
	4,043,791
76	Re.29,367
78	4,043,792
86	4,043,793
	4,043,794
90	4,043,795
98	4,043,796
	4,043,797

CLASS 72

39	4,043,166
61	4,043,160
78	4,043,161
163	4,043,162
255	4,043,163
307	4,043,165
332	4,043,164
340	4,043,167
345	4,043,168
349	4,043,169
364	4,043,170
393	4,043,171
402	4,043,172
403	4,043,173
412	4,043,174

CLASS 73

1 DV	4,043,175
	4,043,176
15 R	4,043,177
23	4,043,178
37	4,043,179
40.5 A	4,043,180
41	4,043,182
59	4,043,183
65	4,043,184
67.7	4,043,185
67.8 R	4,043,181
84	4,043,186
105	4,043,187
116	4,043,188
117.3	4,043,189
141 R	4,043,190
151	4,043,191
155	4,043,192
	4,043,193
178 T	4,043,194
204	4,043,195
	4,043,196
205 R	4,043,197
242	4,043,198
290 R	4,043,199
359 R	4,043,200
398 AR	4,043,201
422 GC	4,043,202
427	4,043,203
486	4,043,218
516 R	4,043,204

CLASS 74

5.5	4,043,205
10.15	4,043,207
10.54	4,043,206
16	4,043,208
60	4,043,209
110	4,043,211
230.17 A	4,043,212
242.8	4,043,213
243 DR	4,043,214
258	4,043,215
410	4,043,216
470	4,043,217
536	4,043,219
543	4,043,220
573 R	4,043,221
606 R	4,043,222
688	4,043,223
710.5	4,043,224
750 R	4,043,210
761	4,043,225
801	4,043,226
868	4,043,227

CLASS 75

53	4,043,798
60	4,043,799
	4,043,800
	4,043,801
63	4,043,802
117	4,043,804
123 L	4,043,805
125	4,043,806
	4,043,807
126 E	4,043,808
134 N	4,043,809
171	4,043,810
257	4,043,803

CLASS 81

57.3	4,043,228
177 A	4,043,230

CLASS 82

24 A	4,043,229

CLASS 83

9	4,043,231
13	4,043,232
23	4,043,233
40	4,043,234
137	4,043,236
207	4,043,235
478	4,043,237
595	4,043,238

CLASS 84

1.01	4,043,240
	4,043,241
1.17	4,043,242
1.25	4,043,243
423	4,043,244

CLASS 85

1 R	4,043,239
3 R	4,043,245
11	4,043,246
31	4,043,247

CLASS 89

1.703	4,043,248
33 CA	4,043,249
170	4,043,250

CLASS 91

376 R	4,043,251

CLASS 92

24	4,043,252
25	4,043,253
85 B	4,043,254
158	4,043,255

CLASS 96

1 R	4,043,811
1.5	4,043,812
1.8	4,043,813
10	4,043,814
33	4,043,815
49	4,043,816
66 R	4,043,817
77	4,043,818
115 P	4,043,819

CLASS 98

1.5	4,043,256
43 R	4,043,257
121 A	4,043,258

CLASS 99

353	4,043,259
421 HH	4,043,260

CLASS 100

26	4,043,261

CLASS 101

7	4,043,262
45	4,043,263
269	4,043,264
350	4,043,265

CLASS 102

24 HC	4,043,266
38	4,043,267
66	4,043,268
87	4,043,269

CLASS 104

12	4,043,271

CLASS 105

136	4,043,272
221 R	4,043,273
409	4,043,274
477	4,043,275

CLASS 106

21	4,043,820
39.6	4,043,821
40 R	4,043,823
48	4,043,824
53	4,043,852
70	4,043,822
87	4,043,825
90	4,043,826
92	4,043,827
97	4,043,828
271	4,043,829
287 SS	4,043,830
288 B	4,043,831

CLASS 108

28	4,043,276
35	4,043,277
150	4,043,278

CLASS 109

50	4,043,279

CLASS 110

7 R	4,043,280

CLASS 111

85	4,043,281

CLASS 112

3 R	4,043,282
163	4,043,283
178	4,043,284

CLASS 114

72	4,043,285
222	4,043,286
266	4,043,287
270	4,043,288

CLASS 115

6.1	4,043,290
29	4,043,291
75	4,043,289

CLASS 118

5	4,043,292
7	4,043,293
9	4,043,294

317 4,043,295
419 4,043,296
640 4,043,297
652 4,043,298

CLASS 119

3 4,043,299

CLASS 123

32 EA 4,043,300
52 B 4,043,301
117 R 4,043,302
119 A 4,043,304
4,043,305
119 R 4,043,303
121 4,043,306
139 AW 4,043,307
143 R 4,043,308
179 G 4,043,310
191 SP 4,043,309

CLASS 125

18 4,043,311

CLASS 126

41 R 4,043,312
121 4,043,313
263 4,043,314
270 4,043,315
4,043,316
4,043,317
271 4,043,318
299 D 4,043,319
299 E 4,043,320

CLASS 127

6 4,043,832

CLASS 128

2 B 4,043,322
2 H 4,043,324
2 V 4,043,321
4 4,043,323
75 4,043,325
82 4,043,326
89 R 4,043,327
132 D 4,043,328
132 R 4,043,329
133 4,043,330
156 4,043,331
214 E 4,043,332
214 R 4,043,333
215 4,043,334
218 N 4,043,335
218 R 4,043,336
229 4,043,337
260 4,043,338
4,043,339
287 4,043,340
303.1 4,043,341
303.14 4,043,342
321 4,043,343
335.5 4,043,344
349 R 4,043,345
4,043,346
419 PG 4,043,347

CLASS 131

243 4,043,348

CLASS 134

34 4,043,833

CLASS 135

5.3 4,043,349

CLASS 136

89 SA 4,043,834
221 4,043,835

CLASS 137

39 4,043,350
204 4,043,353
247.33 4,043,354
312 4,043,355
320 4,043,356
495 4,043,357
512.1 4,043,358
554 4,043,351
625.41 4,043,359

CLASS 138

31 4,043,352
42 4,043,360

CLASS 139

452 4,043,361

CLASS 140

1 4,043,362
93 A 4,043,363
106 4,043,364

CLASS 144

32 R 4,043,365
34 E 4,043,366

CLASS 145

31 R 4,043,367

CLASS 148

1.5 4,043,836
4,043,837
2 4,043,838
20.3 4,043,839
32 4,043,840
32.5 4,043,841
35 4,043,842
37 4,043,843
4,043,844
105 4,043,845
4,043,846
146 4,043,847
187 4,043,848
4,043,849

CLASS 149

19.4 4,043,850

CLASS 150

52 R 4,043,368

CLASS 151

21 C 4,043,369

CLASS 152

354 4,043,370
4,043,372
362 R 4,043,371
365 4,043,373
405 4,043,374

CLASS 156

47 4,043,851
94 4,043,853
158 4,043,854
178 4,043,855
195 4,043,856
198 4,043,857
251 4,043,858
566 4,043,859
624 4,043,860
636 4,043,861

CLASS 157

1 4,043,375

CLASS 162

135 4,043,862
158 4,043,863

CLASS 164

7 4,043,376
4,043,377
17 4,043,378
23 4,043,379
41 4,043,380
65 4,043,381
76 4,043,382
274 4,043,383
282 4,043,384
342 4,043,385

CLASS 165

45 4,043,386
105 4,043,387
166 4,043,388

CLASS 166

55 4,043,389
215 4,043,390
217 4,043,391
4,043,392
248 4,043,393
253 4,043,394
263 4,043,395
274 4,043,396

CLASS 169

45 4,043,397

CLASS 171

16 4,043,398

CLASS 172

42 4,043,399
43 4,043,400
59 4,043,401
112 4,043,402
413 4,043,403
555 4,043,404

CLASS 173

127 4,043,405

CLASS 174

23 R 4,044,200
52 FP 4,044,201
60 Re.29,371

CLASS 175

50 4,043,407
321 4,043,409
323 4,043,410
369 4,043,411

CLASS 176

37 4,043,864
4,043,865
40 4,043,866
4,043,867
50 4,043,868

CLASS 177

25 4,043,412
126 4,043,413
248 4,043,414
255 4,043,415

CLASS 178

88 4,044,202

CLASS 179

1 P 4,044,203
4,044,205
1 SA 4,044,204
84 VF 4,044,206
100.3 B 4,044,207

CLASS 180

6.48 4,043,416
9.54 4,043,417
98 4,043,418
117 4,043,421
132 4,043,419
140 4,043,422

CLASS 181

17 4,043,420

CLASS 182

22 4,043,423
230 4,043,424

CLASS 184

55 A 4,043,425

CLASS 186

1 AC 4,043,426

CLASS 187

12 4,043,427
17 4,043,428
29 R 4,043,429
52 R 4,043,430

CLASS 188

1 B 4,043,431
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73.4 4,043,433
296 4,043,434
319 4,043,435

CLASS 191

32 4,043,436

CLASS 192

13 R 4,043,437

CLASS 195

63 4,043,869
66 R 4,043,870
99 4,043,871
103.5 A 4,043,872

CLASS 197

1 R 4,043,438
18 4,043,439
114 R 4,043,440

CLASS 198

317 4,043,441
420 4,043,442
525 4,043,443
557 4,043,444
611 4,043,445
728 4,043,446
827 4,043,447

CLASS 200

51.09 4,044,208
61.21 4,044,209
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148 H 4,044,210
283 4,044,212
308 4,044,213
316 4,044,214
318 4,044,215

CLASS 203

46 4,043,873
47 4,043,874
82 4,043,875

CLASS 204

9 4,043,876
15 4,043,877
16 4,043,878
18 PC 4,043,879
35 N 4,043,880
102 4,043,881
106 4,043,882
129.65 4,043,883
131 4,043,884
4,043,885
157.1 R 4,043,886
159.23 4,043,887
192 R 4,043,889
192 S 4,043,888
195 S 4,043,890
231 4,043,891
247 4,043,892
281 4,043,893
297 W 4,043,894
301 4,043,895
4,043,896

CLASS 206

1.5 4,043,448
45.14 4,043,449
4,043,450
334 4,043,451
343 4,043,452
349 4,043,453
613 4,043,503

CLASS 208

11 R 4,043,897
50 4,043,898
161 4,043,899
216 4,043,900

CLASS 209

10 4,043,901
81 R 4,043,454
166 4,043,902
167 4,043,455

CLASS 210

22 C 4,043,903
28 4,043,904
31 C 4,043,905
4,043,906
32 4,043,907
43 4,043,908
49 4,043,909
53 4,043,910
62 4,043,911
83 4,043,912
169 4,043,913
4,043,914
195 R 4,043,915
238 4,043,916
323 T 4,043,917
356 4,043,918
407 4,043,919
525 4,043,920

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CLASS 213

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CLASS 214

6 B 4,043,461
6 BA 4,043,460
6 D 4,043,458
6 DK 4,043,459
10.5 R 4,043,462
16.4 A 4,043,463
17 CA 4,043,464
17 DB 4,043,465
18 SC 4,043,466
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85 4,043,468
138 R 4,043,469
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750 4,043,472

CLASS 215

21 4,043,473
211 4,043,474
223 4,043,475

CLASS 219

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76 4,044,217
91 4,044,218
100 4,044,219
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121 LM 4,044,222
135 4,044,223
217 4,044,221
322 4,044,224
336 4,044,225
521 4,044,226

CLASS 220

19 4,043,476
23.4 4,043,477
90.2 4,043,478
266 4,043,481
271 4,043,479
307 4,043,482
334 4,043,480

CLASS 221

155 4,043,483
213 4,043,484
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CLASS 222

134 4,043,486
166 4,043,487
233 4,043,488
397 4,043,489
442 4,043,490
503 4,043,491

CLASS 223

30 4,043,492

CLASS 224

45 S 4,043,493

CLASS 226

109 4,043,494
197 4,043,495

CLASS 227

116 4,043,504

CLASS 228

2 4,043,496
4,043,497
173 4,043,499
175 4,043,500
265 4,043,498

CLASS 229

14 BE 4,043,501
17 B 4,043,502

CLASS 235

61.11 A 4,044,229
61.11 C 4,044,230
61.12 N 4,044,231
61.7 R 4,044,227
61.9 A 4,044,228
92 PE 4,044,233
92 SB 4,044,232
150.21 4,044,234
4,044,235
4,044,236
150.27 4,044,237
151.1 4,044,238
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152 4,044,241
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153 AC 4,044,244

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102 4,043,507
265.19 4,043,508
265.41 4,043,509
323 4,043,510
394 4,043,511
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6.4 CL 4,044,245
78 CF 4,044,246

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36 4,043,514
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87 4,043,523
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251 4,043,528
419 4,043,529
453 4,043,530
537 4,043,531

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201 4,044,248
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311 4,044,254
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518 4,044,267

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2.5 AC 4,043,949
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2.5 FP 4,043,958
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18 S 4,043,953
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4,043,708	4,043,505	4,044,092	4,043,621	4,044,187	4,043,891
6 : Re.29,364	4,043,524	4,044,117	4,043,683	16 : 4,043,003	4,043,996
4,042,975	4,043,525	4,044,128	4,043,828	4,044,163	4,044,062
4,042,979	4,043,555	4,044,186	4,043,840	17 : 4,043,051	4,044,085
4,042,982	4,043,562	4,044,204	4,043,878	4,043,060	4,044,135
4,042,984	4,043,565	4,044,207	4,043,920	4,043,071	4,044,157
4,042,986	4,043,566	4,044,241	4,043,933	4,043,086	4,044,158
4,042,987	4,043,573	4,044,246	4,043,958	4,043,087	4,044,160
4,042,990	4,043,575	4,044,247	4,044,009	4,043,092	4,044,181
4,043,000	4,043,597	4,044,257	4,044,015	4,043,119	4,044,280
4,043,008	4,043,598	4,044,270	4,044,055	4,043,143	4,044,296
4,043,016	4,043,612	4,044,271	4,044,134	4,043,144	4,044,317
4,043,025	4,043,617	4,044,281	4,044,137	4,043,168	4,044,378
4,043,036	4,043,628	4,044,289	4,044,139	4,043,169	18 : Re.29,367
4,043,038	4,043,631	4,044,302	4,044,147	4,043,200	4,043,088
4,043,041	4,043,636	4,044,303	4,044,183	4,043,222	4,043,226
4,043,043	4,043,644	4,044,316	4,044,267	4,043,227	4,043,273
4,043,044	4,043,651	4,044,321	4,044,395	4,043,244	4,043,274
4,043,045	4,043,668	4,044,323	4,044,398	4,043,258	4,043,478
4,043,061	4,043,674	4,044,328	10 : 4,043,005	4,043,272	4,043,624
4,043,066	4,043,689	4,044,335	4,043,010	4,043,276	4,043,790
4,043,096	4,043,702	4,044,347	4,043,722	4,043,286	4,043,791
4,043,103	4,043,717	4,044,352	4,043,752	4,043,320	4,043,810
4,043,113	4,043,742	4,044,360	4,043,763	4,043,333	4,043,905
4,043,117	4,043,760	4,044,362	4,043,793	4,043,340	4,043,960
4,043,129	4,043,776	4,044,369	4,043,794	4,043,370	4,044,000
4,043,133	4,043,813	4,044,372	4,043,829	4,043,374	4,044,002
4,043,136	4,043,839	4,044,376	4,043,961	4,043,375	4,044,149
4,043,175	4,043,856	4,044,387	4,044,059	4,043,397	4,044,150
4,043,176	4,043,872	4,044,389	4,044,071	4,043,403	4,044,151
4,043,195	4,043,881	8 : 4,043,077	12 : 4,043,046	4,043,438	4,044,172
4,043,197	4,043,884	4,043,325	4,043,057	4,043,465	4,044,286
4,043,215	4,043,885	4,043,342	4,043,083	4,043,479	4,044,375
4,043,218	4,043,894	4,043,523	4,043,100	4,043,481	4,044,379
4,043,243	4,043,897	4,043,582	4,043,105	4,043,495	19 : 4,042,998
4,043,287	4,043,906	4,043,595	4,043,147	4,043,547	4,043,099
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		245,507			245,545			245,497	29	:	245,498
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PLANT PATENTS

6	:	4,093	18	:	4,094						

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